Message

From: Faison, George [Faison.George@epa.gov]
Sent: 12/13/2019 3:57:02 PM
To: Spells, Charlene [Spells.Charlene@epa.gov]; Galbraith, Michael [Galbraith.Michael@epa.gov]
CC: Young, Jessica [Young.Jessica@epa.gov]; Atagi, Tracy [Atagi.Tracy@epa.gov]
Subject: Re: NSPS Subpart EEEE

Hi - just FYI, Tod Martin's issues were also included in the original email from Pryanka at Renewology to Kathleen Salyer our Deputy OD.

George Faison
U.S. Environmental Protection Agency
OSWER, ORCR
1200 Pennsylvania Avenue, NW
Mail Code 5303P
Washington, DC 20460
Phone - (703)305-7652

From: Spells, Charlene <Spells.Charlene@epa.gov>
Sent: Friday, December 13, 2019 9:35:14 AM
To: Galbraith, Michael <Galbraith.Michael@epa.gov>
Cc: Faison, George <Faison.George@epa.gov>; Young, Jessica <Young.Jessica@epa.gov>
Subject: RE: NSPS Subpart EEEE

Hi Mike,

Thanks for passing this on. I am working with George and Jessica on this very issue. You sent him to the right person for the NSPS part **Ex. 6 Personal Privacy (PP)** We are still deliberating on the NHSM merits of the situation.

Charlene E. Spells
U.S. EPA
OAQPS/SPPD
RTP, NC 27711
Phone: (919) 541-5255 Fax: (919) 541-0516
spells.charlene@epa.gov

From: Galbraith, Michael <Galbraith.Michael@epa.gov>
Sent: Friday, December 13, 2019 9:24 AM
To: Todd Martin (AQD) <Todd.Martin@maricopa.gov>
Cc: Spells, Charlene <Spells.Charlene@epa.gov>
Subject: Re: NSPS Subpart EEEE

Hi Todd - I'm not the right person for issues relating to eeee. I cc'd Charlene Spells in OAQPS who may be the contact (if not she can refer you to the right person).

There may be a tie-in to our office's role in RCRA definition of solid waste issues, but I think Charlene (or whoever the oaqps eeee contact is) would be best to determine if we would need to weigh in on that issue.

Mike Galbraith
Permits Branch (5303P)
Program Implementation/Information Division
Office of Resource Conservation and Recovery
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

From: Todd Martin (AQD) <Todd.Martin@maricopa.gov>
Sent: Thursday, December 12, 2019 2:09 PM
To: Galbraith, Michael <Galbraith.Michael@epa.gov>
Subject: NSPS Subpart EEEE

Mr. Galbraith,

I was given your name as someone who might be able to assist with an NSPS Subpart EEEE - Standards Of Performance for Other Solid Waste Incineration Units applicability question. If you are not the right person for this question perhaps you could point me in the right direction?

SCENARIO:
A business that converts plastic to fuel is looking to build a new facility in the Phoenix area. They will be diverting plastic from a local MSW Landfill, shredding it and using it as a feedstock for a pyrolysis process for the production of more valuable fuels, chemicals and other intermediates. The initial throughput will be about 10 tons/day.

QUESTION:
Is the facility subject to NSPS Subpart EEEE? This is a crucial question because Subpart EEEE triggers the need for a Title V permit per §60.2966.

DISCUSSION:
In reading the rule applicability it seems like NSPS Subpart EEEE would apply. However, there are two potential exemptions that I'd like to better understand.

1. All of rules other than Subpart EEEE that apply to Municipal Waste Combustion Units have the following exemption:
Municipal waste combustion units do not include pyrolysis or combustion units located at a plastics or rubber recycling unit.
Where:
Plastics or rubber recycling unit means an integrated processing unit for which plastics, rubber, or rubber tires are the only feed materials (incidental contaminants may be in the feed materials). The feed materials are processed and marketed to become input feed stock for chemical plants or petroleum refineries.

This exemption is found in both NSPS Subpart AAAA and NSPS Subpart Cb even though both of these rules apply to facilities much larger than the facilities subject to NSPS Subpart EEEE.

It seems that the facility in question meets the definition of a "Plastics or rubber recycling unit". However, there is no exemption for these units in NSPS Subpart EEEE like there is in similar rules. This seemingly leads to the paradox that a plastics or rubber recycling unit that processes less than 35 tons/day requires a Title V permit, while those that process more than 35 tons/day do not. Is this correct, or is there a similar exemption for plastics or rubber recycling units in Subpart EEEE that I'm missing?

2. The facility is claiming that they do not meet the definition of a "Solid Waste Incineration Unit" because the plastic feedstock is not a solid waste it is a raw material. They appear to be making this argument based on RCRA standards rather than those of Subpart EEEE which state:

Municipal solid waste means refuse (and refuse-derived fuel) collected from the general public and from residential, commercial, institutional, and industrial sources consisting of paper, wood, yard wastes, food wastes, plastics, leather, rubber, and other combustible materials and non-combustible materials such as metal, glass and rock, provided that: (1) the term does not include industrial process wastes or medical wastes that are segregated from such other wastes; and (2) an incineration unit shall not be considered to be combusting municipal solid waste for purposes of this subpart if it combusts a fuel feed stream, 30 percent or less of the weight of which is comprised, in aggregate, of municipal solid waste, as determined by §60.2887(b).

Solid waste means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1342), or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended (42 U.S.C. 2014).

Refuse-derived fuel means a type of municipal solid waste produced by processing municipal solid waste through shredding and size classification. This includes all classes of refuse-derived fuel including two fuels:
(1) Low-density fluff refuse-derived fuel through densified refuse-derived fuel.
(2) Pelletized refuse-derived fuel.

It seems pretty clear to me that plastic feedstock is "refuse-derived fuel" which is considered "municipal solid waste" is a "solid waste". Do you agree?

Any help would be greatly appreciated.

Thank you,

Maricopa County AIR QUALITY DEPARTMENT

Todd Martin • Permitting Supervisor
Maricopa County Air Quality Department
3800 N. Central Ave., Suite 1400 | Phoenix, AZ 85012
Desk: 602.506.7248 | todd.martin@maricopa.gov
CleanAirMakeMore.com | Maricopa.gov/AQ

Burn Cleaner, Burn Better.
On No Burn Days, Don't Burn Wood.

Message

From: Zuniga, Mario [zuniga.mario@epa.gov]
Sent: 7/31/2020 7:55:42 PM
To: Daniel Dodd [ddodd@sierraenergy.com]
CC: Adams, Elizabeth [Adams.Elizabeth@epa.gov]; Zimpfer, Amy [Zimpfer.Amy@epa.gov]; Yannayon, Laura [Yannayon.Laura@epa.gov]; Mia, Marcia [Mia.Marcia@epa.gov]; Modak, Nabanita [Modak.Nabanita@epa.gov]; Atagi, Tracy [Atagi.Tracy@epa.gov]; Dancher, Nathan [Dancher.Nathan@epa.gov]; Smith, Noah [SMITH.NOAH@EPA.GOV]; Mary Giraudo [MGiraudo@mbard.org]
Subject: Applicability of Clean Air Act Other Solid Waste Incinerators Rule, 40 CFR Part 60, Subpart EEEE to FastOx Gasification Biorefinery Pilot Project, Monterey County, CA
Attachments: DD_Applicability Determination Letter_Sierra Energy.pdf

Mr. Dodd:

Please see the attached letter from EPA Region 9's Air Division Director determining the applicability of the Standards of Performance for Other Solid Waste Incinerators Rule, 40 CFR Part 60, subpart EEEE to the FastOx Gasification Biorefinery at the Department of Defense facility Fort Hunter Liggett in Monterey County, California.

Please feel free to contact me if you have any questions regarding this letter.

Thank you,

Mario Abraham Zuñiga
Air Permits Section (AIR-3-1)
U.S. EPA, Region 9
(415)947-4282

Message

From: Castro, Grecia [Castro.Grecia@epa.gov]
Sent: 6/20/2019 3:20:31 PM
To: HOFFMAN Matt [Matt.Hoffman@state.or.us]; Vetter, Cheryl [Vetter.Cheryl@epa.gov]
CC: DEFEHR DANIEL [Daniel.Defehr@state.or.us]; MESSINA Frank [Frank.MESSINA@state.or.us]; PALERMO Jaclyn [Jaclyn.PALERMO@state.or.us]; BAILEY Mark [Mark.Bailey@state.or.us]; ORMAN Michael [Michael.ORMAN@state.or.us]; DIETRICH Steve [Steve.Dietrich@state.or.us]; Spells, Charlene [Spells.Charlene@epa.gov]; Fruh, Steve [Fruh.Steve@epa.gov]
Subject: RE: Biochar devices- are they ACI's?
Attachments: Applicability determination Subpart CCCC gasification pilot.pdf

Hi Matt – Please let us know the EPA individual with whom you had previous conversations about using this equipment. This information will help us coordinate and expedite the response regarding whether the Carbonator 500 device is an incineration unit (e.g. an air curtain incinerator v. a "unit that burns wood for the production of charcoal"). My search of the ADI did not result in any previous determination directly on point, but the document attached provides an example of the type of analysis and information needed to support a determination that an emission unit does not meet the criteria for the process unit subject to regulation.

In re to your second question about the meaning of the CISWI preamble language, the simple answer is that the EPA has not exempted from title V applicability any non-major sources subject to 129 requirements and this includes portable sources.

- EPA interprets that Section 129(g)(1) of the CAA requires the Administrator to issue emissions standards for categories of solid waste incineration units while for ACI that only burn wood waste, yard waste and clean lumber, it requires opacity limitations instead.
- Consistent with CAA Section 129(e), ACI units subject to an opacity limitation under the 111/129 must obtain a title V operating permit.
- While there are no exemptions from title V applicability on the basis that a source is portable, in a rulemaking the EPA may determine the need to exempt area sources subject to NSPS or NESHAP standards. See 40 CFR 70.3 (a)(2) & (b)(2). (As noted above the EPA rules issued after 1990 to impose 111/129 requirements do not exempt from title V any category of non-major sources subject to those requirements.)
- If it is determined that the Carbonator 500 device is an ACI unit under CISWI or OSWI, a title V permit will be required for operation.
  - Sources, temporary at a location, may obtain a single operating permit for operating at multiple locations. See 70.6(e)

From: HOFFMAN Matt <Matt.Hoffman@state.or.us>
Sent: Tuesday, June 18, 2019 6:28 PM
To: Vetter, Cheryl <Vetter.Cheryl@epa.gov>; Castro, Grecia <Castro.Grecia@epa.gov>
Cc: DEFEHR DANIEL <Daniel.Defehr@state.or.us>; MESSINA Frank <Frank.MESSINA@state.or.us>; PALERMO Jaclyn <Jaclyn.PALERMO@state.or.us>; BAILEY Mark <Mark.Bailey@state.or.us>; ORMAN Michael <Michael.ORMAN@state.or.us>; DIETRICH Steve <Steve.Dietrich@state.or.us>
Subject: Biochar devices- are they ACI's?

Dear Cheryl and Grecia,

I'm writing in reference to a request by Blackwood Solutions, out of Indiana, to operate a portable Carbonator 500 device (in Oregon) to turn forest slash into biochar. Based on previous conversations with EPA, and per EPA definition, these biochar units fit the definition of an air curtain incinerator- except that they are not incinerating into ash- rather they are producing biochar.

Is the Carbonator 500 an incineration unit subject to Title V permitting requirements, or is this a pyrolysis device not subject to those requirements?

We've had significant back and forth with several entities wanting to use these devices to clear slash, as an alternative to open burning. Can you clarify whether this device would need a Title V permit?

Second, can you clarify what the final sentence means in the following excerpt from the Federal Register (response to comment on TV permitting requirements for ACI's in the preamble to the March 21, 2011, final CISWI rule (76 FR 15741)? It reads, "...we decline to consider a title V exemption for minor and area source ACI's at commercial and industrial facilities." Would the same apply to portable sources?

Thank you very much for your time,

Matt

From the Federal Register clarifying promulgated amendments and clarification of requirements of CISWI rules on 4/16/19:
The EPA's intent is further demonstrated in a response to comment on title V permitting requirements for ACIs in the preamble to the March 21, 2011, final CISWI rule (76 FR 15741):
Commenters are correct that ACIs are not solid waste incineration units pursuant to CAA section 129(g)(1)(C), but that is only correct if the units ''only burn wood wastes, yard wastes and clean lumber and [they] * * * comply with opacity limitations to be established by the Administrator by rule.'' The EPA has established opacity limitations for ACIs pursuant to CAA sections 111 and 129.
Pursuant to CAA section 502(a), sources subject to standards or regulations under CAA section 111 must obtain a title V permit; therefore, ACIs are required to obtain a title V permit. As commenters note, the EPA may exempt minor and area sources from the requirement to obtain a title V permit, but the EPA must first determine that compliance with title V requirements is ''impracticable, infeasible, or unnecessarily burdensome'' for the sources before exempting them (CAA section 502(a)). The EPA has not made the necessary finding pursuant to CAA section 502(a) for ACIs in any of the CAA section 129 rulemakings, and we believe that ACIs exist at CAA section 129 facilities other than at the commercial and industrial facilities subject to this final rule. Because we think it is important to treat all ACIs in the same manner, we decline to consider a title V exemption for minor and area source ACIs at commercial and industrial facilities.

Matt Hoffman
Northwest Region Air Quality Manager
Oregon Department of Environmental Quality
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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61 FORSYTH STREET
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MAR 0 2 2017

Dr. Judi Krzyzanowski
Krzyzanowski Consulting
1967 Moira Road
Roslin Ontario, Canada K0K 2Y0

Dear Dr. Krzyzanowski:

We have received your July 5, 2016, letter ("July letter") requesting a determination regarding the applicability of 40 CFR Part 60 Subpart CCCC – "Standards of Performance for Commercial and Industrial Solid Waste Incineration (CISWI) Units" for your client, the Carbon Black Global LLC (CBG) facility in Dunlap, Tennessee. The request relates to a pilot "scaled-down" unit that will be used to optimize and research the gasification of a variety of carbon-based waste feedstocks for clients. Based on our review of the July letter and the additional information provided by CBG on August 23, 2016, September 16, 2016, and December 12, 2016, we have determined the proposed operation of the pilot unit is not a CISWI unit and will not be subject to Subpart CCCC.

In the July letter, you provided the following details about the CBG pilot unit. The process will gasify a variety of carbon-based feedstocks by using downdraft gasification to produce charcoal or activated carbon and synthetic gas (syngas) for energy production. The pilot unit operated by CBG will handle no more than 100 pounds of feedstock at a time, and no more than one batch of any feedstock will be processed in any given day. Municipal Solid Waste (MSW) will be tested in the pilot unit as a feedstock no more than twice each quarter, for a maximum of eight batches of MSW per calendar year, and at no time in excess of 30 percent of the load by weight (estimates are that it will remain below 12 percent).

The process in the CBG pilot unit begins by loading the reactor vessel with a 10-inch layer of charcoal on top of a perforated base. The feedstock is loaded on top of the charcoal. The reactor vessel is then placed into an autoclave where gasification occurs. Temperature, pressure, and air/oxygen levels in the autoclave will be regulated, partially through the use of steam injection, and will be optimized for each individual feedstock. The syngas produced in the process will then be passed through a set of two packed-tower wet scrubbers followed by a fabric-filter before being diverted to a flare. In real-world client applications the syngas will be used to produce energy, but due to the research and development nature of the CBG pilot unit the syngas will be flared off. The results from waste feedstock test batches will be used to optimize the process for each waste feedstock in order to increase efficiency and reduce emissions. The July letter describes that at no time does combustion of the waste feedstock occur, and both temperature and air content within the autoclave are highly regulated to ensure this.

In an email to the U.S. Environmental Protection Agency on August 23, 2016, you provided a temperature profile showing four different time and temperature profiles associated with different test conditions (minimum temperature/minimum time, minimum temperature/maximum time, maximum temperature/minimum time, and maximum temperature /maximum time). On September16, 2016, you provided a document to elucidate the temperature profile. Our understanding of the temperature profile

and documentation is that it depicts, for the first five minutes, the ignition of the charcoal using non-solid waste fuel (i.e., natural gas or light fuel oil) with the addition of five percent (volume) compressed air for combustion.

In a follow-up letter of December 12, 2016, ("December letter") you provided additional detail about the startup of the process and described that the flame used on cold-start is underneath the charcoal base and never comes into contact with the charcoal (and as stated in the July letter, never comes in contact with the waste feedstock). You also state that not all of the charcoal will be ignited before the ignition (intake) valve is closed to eliminate air intake, but that there is sufficient heat within the system to continue the heating of the charcoal base, and to initiate the gasification process. The EPA is able to discern this from the temperature profile; the temperature reaches 700 to 800°C due to the fuel-based flame and ignition of charcoal during the first five minutes of operation.

You also provided additional detail in the December letter regarding the operation of the ignition (intake) valve to ensure that oxygen levels are kept below those needed to sustain combustion. The process valves are solenoid valves with modulating valve controls (MVCs). The ignition MVC is able to regulate air intake to the fraction of a percent, and is responsible for the supply of five percent air into the system to initiate combustion of the lower charcoal layer, during the first five minutes. The MVC closely regulates the amount of air in the autoclave throughout the gasification process, allowing just enough oxygen to stimulate and maintain certain chemical processes, but not enough to initiate combustion. Steam acts as the primary supply of chemical oxygen in gasification reactions, but at no time during the process would there be enough oxygen in the system to allow for the combustion of waste feedstock.

Our understanding is that after the initial five-minute period, the fuel source and air/oxygen source are cut off and the unit is sealed, with the exception of holes at the top of the vessel that draw all gases upwards, out through the holes, down through the shield and into the scrubber via pressure differentiation. At this time, the gasification process begins, as there is no longer sufficient air/oxygen to support combustion. The EPA can see from the temperature curves that the gasification temperature, depending on the four different profiles, can range from 300 to 800°C. The temperature profile also shows a hot steam activation during the 45 to 180 minute time range causing the temperature to rise to 850°C, and which you state is done to improve the quality of the syngas. The temperature diagram indicates a cool steam quench is performed to bring the vessel temperature back down to between 70 and 100°C the intention of which, by your description, is to reduce the possible formation of secondary products such as dioxins and furans.

As indicated in §60.2010, Subpart CCCC applies to a new incineration unit that is a CISWI unit and that is not one of the types of units excluded under §60.2020. A *CISWI unit* is defined in §60.2265 as "any distinct operating unit of any commercial or industrial facility that combusts, or has combusted in the preceding 6 months, any solid waste as that term is defined in 40 CFR part 241. If the operating unit burns materials other than traditional fuels as defined in §241.2 that have been discarded, and you do not keep and produce records as required by §60.2175(v), the operating unit is a CISWI unit."

The EPA recognizes that gasification, by itself, is not combustion. According to your description, while there is combustion of the charcoal and external fuel (i.e., natural gas or light fuel oil) in the first five minutes of operation, the external fuel source and air are cut off, transitioning the process to gasification before combustion of the waste feedstock will occur. This also initiates the gasification process of the waste feedstock, which is required to produce the carbon black product and ultimately, the syngas. From

your description, we believe that the MVC is able to regulate the presence of oxygen in the system and to preclude combustion of the waste feedstock from occurring. Therefore, we do not believe that the unit meets the criteria that the unit is "any distinct operating unit of any commercial or industrial facility *that combusts, or has combusted* in the preceding 6 months, any solid waste as that term is defined in 40 CFR part 241" and, for this reason, Subpart CCCC does not apply to the gasification process described by CBG.

We note that for the CBG process, the resultant syngas will be flared. Subpart CCCC applies to the combustion of waste gases that are in a container when combusted (see §60.2265). Since the resultant syngas will not be in a container when combusted in the flare, Subpart CCCC will not apply to the flare.

While operation of the pilot unit by CBG will not be subject to Subpart CCCC, combustion of syngas produced by the gasification of other wastes, by CBG clients, should be evaluated by the appropriate delegated permitting agency for potential applicability under section 129 or section 112 (in the case of hazardous waste rules). For example, 40 CFR Part 60 Subpart EEEE applies to *other solid waste incineration units*, which include very small municipal waste combustion units and institutional waste incineration units. A *very small municipal waste combustion unit* is defined in Subpart EEEE as "any municipal waste combustion unit that has the capacity to combust less than 35 tons per day of MSW or refuse-derived fuel, as determined by the calculations in §60.2975." A very small municipal waste combustion unit may be exempt from Subpart EEEE if the criteria in §60.2887(b) are met. The criteria for being exempt include a requirement that a very small municipal waste combustion unit have a federally enforceable permit limiting the combustion of MSW to 30 percent of the total fuel input by weight. Subpart EEEE applies, in part, to the combustion of gasified MSW (i.e., syngas) produced by pyrolysis/combustion units. This applicability is similar to 40 CFR Part 60 Subpart AAAA – "Standards of Performance for Small Municipal Waste Combustion Units" which applies to municipal waste combustion units that have the capacity to combust at least 35 tons per day but no more than 250 tons per day of MSW or refuse-derived fuel.

This determination was coordinated with the EPA's Office of Enforcement and Compliance Assurance, the Office of General Counsel, the Office of Land and Emergency Management, and the Office of Air Quality Planning and Standards. If you have any questions concerning the determination provided in this letter, please contact Todd Russo at (404) 562-9194.

Sincerely,

Beverly H. Banister
Director
Air, Pesticides and Toxics Management Division

cc: Sara Ayres, OECA
Marcia Mia, OECA
Nabanita Modak, OAQPS
George Faison, OLEM
Paul Versace, OGC

Message

From: Peter [pbrady@alpinetechnology.com]
Sent: 4/23/2021 4:41:20 PM
To: Hambrick, Amy [Hambrick.Amy@epa.gov]
Subject: Gasification exemption & What is a waste
Attachments: Germany at Jan 2020 List of New Projects.docx

The US is missing out on a big piece of the biosolids equation; Resource recovery

Hi Amy,

I have probably sent you information previously regarding the situation in Germany since 2017, and is now occurring in other countries.

In the early 2000s Germany conducted a study, and determined that phosphorus was a vital global resource, and did an extensive audit on how to conserve it.

One of their key findings was that the ash from mono (municipal sludge) incineration was a key constituent for a "manufacturing" process. They then passed a regulation that all WWTPs over a certain size needed to "produce" mono ash as a preferred material for phosphorus conservation. As a result there are now over 20 facilities in design and construction - see attached.

Hopefully, these findings will be taken into consideration in the US in the future.

Best wishes

Peter

---- On Fri, 23 Apr 2021 10:59:50 -0500 **Hambrick, Amy <Hambrick.Amy@epa.gov>** wrote ----

Hi Peter,

Nice talking with you.

We do periodically have other types of units that do not fit into the typical rule subcategories (e.g. FB and MH) that come to EPA requesting formal applicability determinations. These could be situations where there is a question of whether or not incineration is occuring and how the unit may or may not be subject to CAA 129 rules. These determinations are handled on a case-by-case basis. Using gasification as an example.... CAA section 129 rules SSI, CISWI, OSWI, and HMIWI do not offer clear applicability or guidance for gasification units. These types of units need to go through case by case formal applicability determinations and provide EPA with specific technical information to determine the unit is not an incinerator and not subject to a 129 rule. Applicability determinations are not rulemaking but rather site specific final agency actions that only apply to the person (facility owner/operator) that the letter is written to. Another facility can use a previously issued determination as guidance only to make an argument for their specific case/ applicability determination, but they can't use it as a "shield" and they can't use it like a rule. In other words an determination made on my facility cannot be used for your facility.
Another reminder regarding the Identification of Non-Hazardous Secondary Materials That Are Solid Waste . Sewage sludge can be processed and used as a fuel if it meets criteria established by RCRA. In these cases the biosolid fuel may be used as an ingredient for something else e.g., Cement kiln. In other situations, sewage sludge is combusted in other types of incinerators other than those at waste water treatment plants. For these two scenarios, CAA 112 rules may apply or other CAA 129 rules. See under "W" Waster Determinations.
Please let me know if you would like to discuss further. I do hope this email is helpful.

Amy

From: Peter <pbrady@alpinetechnology.com>
Sent: Friday, April 23, 2021 9:48 AM
To: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: Gasification exemption & What is a waste

Hi Amy,

I appreciated you taking some time this morning for a telecom, and I look forward to your email.

Attached is the draft? EPA chart regarding Fuel .v. Solid Waste I came across from 2011.

Best wishes

Peter

Peter Brady

Message

From: Lloyd Winchell [LWinchell@brwncald.com]
Sent: 8/4/2021 2:28:14 PM
To: Modak, Nabanita [Modak.Nabanita@epa.gov]
CC: Hambrick, Amy [Hambrick.Amy@epa.gov]
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations
Attachments: EPA-AriesDetermine-2013.pdf

Thanks again Nabanita.

I was able to find in the index the attached determination for the MaxWest, now Aries, facility setting a precedence for gasification systems. Aries has been using this as evidence for their Taunton, NJ development and probably Linden, NJ which is under construction. I wasn't able to find a determination for either of these facilities in the index. Linden is under construction, so wouldn't they need one? Or, can they use the attached to obtain a construction permit?

I also haven't found any determinations for the BioforceTech (pyrolysis, Redwood City, CA) or Ecoremedy (gasifier, Morristown, PA) facilities. Wouldn't they require a determination?

Lloyd

Lloyd Winchell
Associate, Environmental Engineer
Brown and Caldwell | Saint Paul, MN
LWinchell@brwncald.com
T 651.468.2051 | **C** 651.212.0526

From: Modak, Nabanita <Modak.Nabanita@epa.gov>
Sent: Tuesday, August 03, 2021 4:24 PM
To: Lloyd Winchell <LWinchell@brwncald.com>
Cc: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Hi Lloyd,
Here is a link for the process manual that describes the applicability determination process in EPA.

EPA Process Manual for Responding to Requests Concerning Applicability and Compliance Requirements of Certain Clean Air Act Stationary Source Programs

Also, below is a link for Applicability Determination Index. You can view the past applicability determination letters that have been issue by EPA.

https://cfpub.epa.gov/adi/

Hope you find this information helpful. Please let us know if you have further questions.

Thanks
Nabanita

From: Lloyd Winchell <LWinchell@brwncald.com>
Sent: Tuesday, August 3, 2021 4:56 PM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Cc: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Thanks Nabanita and Amy,

Is there a simplistic guide to the referenced applicability determination? Perhaps a flow sheet or decision tree? I'm a permitting novice at best but I'm trying to provide valuable information in this publication we're working on.

Lloyd

Lloyd Winchell

Associate, Environmental Engineer
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From: Modak, Nabanita <Modak.Nabanita@epa.gov>
Sent: Monday, August 02, 2021 4:55 PM
To: Lloyd Winchell <LWinchell@brwncald.com>
Cc: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Hi Lloyd,
I agree with Amy that given the current regulatory construct of HMIWI, CISWI, OSWI, and SSI rules, facilities employing pyrolysis and/or gasification processes have to go through site-specific applicability determination process to see whether these processes are subject to section 129 of the Clean Air Act. However, EPA intends to collect more information and gain a comprehensive understanding on pyrolysis and gasification processes. Based on data and information received, the agency will evaluate the appropriate next steps in regulating pyrolysis and gasification units.

Thanks
Nabanita

From: Hambrick, Amy <Hambrick.Amy@epa.gov>
Sent: Friday, July 30, 2021 11:22 AM
To: Lloyd Winchell <LWinchell@brwncald.com>
Cc: Modak, Nabanita <Modak.Nabanita@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Hi Lloyd,

Thanks for your email. Yes the email I exchanged with Peter Brady is still current and is true for both gasification and pyrolysis. I cc'd Nabanita Modak in case she has anything to add here. Nabanita and I both work on regulation development of incineration regulations under section 129 of the Clean Air Act. We are always interested in learning more on this topic. Please keep us posted on any results you can share.

Amy

From: Lloyd Winchell <LWinchell@brwncald.com>
Sent: Monday, July 26, 2021 5:41 PM
To: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: Gasification/Pyrolysis Air Emissions Regulations

Hello Ms. Hambrick,

I'm working on some research regarding pyrolysis and gasification processes for sewage sludge. Part of that research includes putting together a publication describing these technologies and providing a brief comparison to incineration. Part of that comparison would include the air emission regulations all of these technologies fall under. Peter Brady had shared the e-mail below between the two of you regarding the EPA's position for gasification, which I would assume applies to pyrolysis as well. I believe Peter solicited your response based on pyrolysis/gasification vendors with permitted facilities advertising their systems as not being considered SSIs and therefore not needing to meet the CAA 129 rules. I assume your response is still valid but I wanted to be certain as I intend to cite it in the publication.

For a little more background on the research, I'm leading a study regarding the fate of PFAS through SSIs funded in part by the Water Research Foundation. Based on the preliminary work for that study we understand the relevant means for PFAS destruction is high temperature processing, and pyrolysis/gasification are the other commercially available technologies to the wastewater industry. So, we initiated a research program which will first produce the said publication. We then plan to distribute this publication to utilities as the background for a survey on the industry interest in these technologies. This second part we plan to collaborate as we can with EPA and have been in contact with Eben Thoma and others in ORD. We've got some bench and full-scale work in progress as well along with another grant application. If you have any questions I'd be happy to talk at your convenience.

Thanks,

Lloyd

========== Forwarded message ==========
From: Hambrick, Amy <Hambrick.Amy@epa.gov>
To: "pbrady@alpinetechnology.com"<pbrady@alpinetechnology.com>
Date: Fri, 23 Apr 2021 10:59:50 -0500
Subject: RE: Gasification exemption & What is a waste
========== Forwarded message ==========

Hi Peter,

Nice talking with you.

We do periodically have other types of units that do not fit into the typical rule subcategories (e.g. FB and MH) that come to EPA requesting formal applicability determinations. These could be situations where there is a question of whether or not incineration is occuring and how the unit may or may not be subject to CAA 129 rules. These determinations are handled on a case-by-case basis. Using gasification as an example…. CAA section 129 rules SSI, CISWI, OSWI, and HMIWI do not offer clear applicability or guidance for gasification units. These types of units need to go through case by case formal applicability determinations and provide EPA with specific technical information to determine the unit is not an incinerator and not subject to a 129 rule. Applicability determinations are not rulemaking but rather site specific final agency actions that only apply to the person (facility owner/operator) that the letter is written to. Another facility can use a previously issued determination as guidance only to make an argument for their specific case/ applicability determination, but they can't use it as a "shield" and they can't use it like a rule. In other words an determination made on my facility cannot be used for your facility.

Another reminder regarding the Identification of Non-Hazardous Secondary Materials That Are Solid Waste . Sewage sludge can be processed and used as a fuel if it meets criteria established by RCRA. In these cases the biosolid fuel may be used as an ingredient for something else e.g., Cement kiln. In other situations, sewage sludge is combusted in other types of incinerators other than those at waste water treatment plants. For these two scenarios, CAA 112 rules may apply or other CAA 129 rules. See under "W" Waster Determinations.
Please let me know if you would like to discuss further. I do hope this email is helpful.

Amy

Lloyd Winchell

Associate, Environmental Engineer
Brown and Caldwell | Saint Paul, MN
LWinchell@brwncald.com
T 651.468.2051 | **C** 651.212.0526

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 19 2013

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

Jeff Snyder
Chief Marketing Officer
MaxWest Environmental Systems Incorporated
1485 International Parkway
Suite 1031
Lake Mary, Florida 32746

RE: Request for Determination of Applicability under 40 CFR Part 60, Subpart MMMM - Emissions Guidelines and Compliance Timelines for Existing Sewage Sludge Incineration Units

Dear Mr. Snyder:

This letter is in response to your email of November 7, 2013, in which you inquired on the status of a September 24, 2013, request for applicability submitted on behalf of MaxWest Environmental Systems, Incorporated (MaxWest) by Ms. Bernadette Rappold, of McGuire Woods. Ms. Rappold requested a determination of applicability under 40 CFR Part 60, Subpart MMMM - Emissions Guidelines and Compliance Timelines for Existing Sewage Sludge Incineration Units (SSI EG Rule) for a sewage sludge gasifier located in Sanford, Florida and owned by MaxWest. Your November 7, 2013 email confirms that the McGuire Woods' request for applicability is being made on behalf of MaxWest.

For the reasons stated below, the Environmental Protection Agency (EPA) believes that the neither the MaxWest sewage sludge gasifier nor thermal oxidizer process heater are subject to the SSI EG Rule.

Background

According to the McGuire Woods' request, MaxWest constructed a fixed bed downdraft gasifier for processing biosolids[1] in late 2008. Operation began during September 2009. The original fixed bed downdraft gasifier was replaced with a fluidized bed design; construction on this unit began September 26, 2011[2]. According to information provided in your letter, the current process involves a continuous feed of dried biosolids into the gasifier. The gasifier is operated in an oxygen-starved environment at a temperature of approximately 704 degrees celcius (°C). No flame is applied to the sewage sludge in the gasifier, nor is a flame propogated as a result of the heating. The gasifier produces what is called a synthetic gas or "syngas." Once the syngas exits the gasifier, it is routed through a particulate matter cyclone and then to a process heater and heat exchanger for heat recovery. The

[1] MaxWest provides that the biosolid feed to the gasifier is sewage sludge.
[2] In determining applicability to Subpart MMMM, the EPA used the "commenced construction" dates as provided by MaxWest. In other words, we did not determine if the applicability of Subpart LLLL at Section 60.4775 applies instead.

syngas is combusted in the process heater to generate the heat needed to dry new incoming sludge. The flue gas exiting the process heater and heat exchanger is routed to a baghouse and a wet scrubber.

EPA Response

As means of background, an emissions guideline (such as the SSI EG) does not apply directly to a source. Instead, the emissions guideline applies to Administrators of air quality programs in a state or in a United States protectorate. The emissions guideline directs those Administrators on the content, timing, and requirements for developing a state plan in order to implement the guideline. A state is required to submit a plan for approval to EPA, to implement and enforce the EG, not later than 1 year after EPA promulgates the EG. See U.S.C. §7429(b)(2). If a state has not submitted an approvable plan within two years after the date of promulgation of an EG, then the EPA shall develop, implement and enforce a federal plan. See U.S.C. §7429(b)(3). Emissions guidelines are not enforceable until the EPA approves a state plan (or adopts a federal plan that implements and enforces the guideline), and the state (or federal) plan has become effective. The SSI EG was promulgated on March 21, 2011, and Florida did not submit a state plan for the SSI EG by the March 21, 2012, deadline. See Section 60.5005(b). EPA is currently drafting a proposed federal implementation plan.

For the purposes of this response, we are determining whether MaxWest owns and operates an SSI as that term is defined in the SSI EG Rule, and therefore, whether the SSI Federal Plan would be applicable, once finalized.

According to Section 60.5060, the SSI EG rule applies to SSI units that are constructed on or before October 14, 2010, or modified on or before September 21, 2011.

An SSI unit is defined at Section 60.5250 as:

> . . . an incineration unit combusting sewage sludge for the purpose of reducing the volume of the sewage sludge by removing combustible matter. Sewage sludge incineration unit designs include fluidized bed and multiple hearth. A SSI unit also includes, but is not limited to, the sewage sludge feed system, auxiliary fuel feed system, grate system, flue gas system, waste heat recovery equipment, if any, and bottom ash system. The SSI unit includes all ash handling systems connected to the bottom ash handling system. The combustion unit bottom ash system ends at the truck loading station or similar equipment that transfers the ash to final disposal. The SSI unit does not include air pollution control equipment or the stack.

Sewage sludge is also defined at Section 60.5250 as:

> . . . [a] solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash

generated during the firing of sewage sludge in a sewage sludge incineration unit or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.

The preamble to March 21, 2011, final rule describes an SSI unit as "an enclosed device or devices using controlled flame combustion that burns sewage sludge for the purpose of reducing the volume of sewage sludge by removing combustible matter." See 76 FR 15372. According to the information provided by MaxWest, no flame is applied or propogated in the gasifier and the gasifier prevents combustion by limiting the air-to-sludge ratio such that combustion cannot occur. Therefore, we do not believe that the gasifier is an SSI, because it does not combust sewage sludge.

With regard to the thermal oxidizer process heater, combustion of the syngas does take place in this unit. The definition of sewage sludge at Section 60.3930 includes "material derived from sewage sludge." According to the information provided by Maxwest, the syngas is derived from sewage sludge through the gasification process. The definition of sewage sludge is expressly limited to the "solid, semisolid, or liquid residue generated during the treatment of domestic sludge in a treatment works." Since syngas is a gas, and not a solid, semisolid, or liquid, it does not meet the definition of sewage sludge in the SSI EG rule (even though it is derived from sewage sludge). Therefore, EPA believes that the combustion of the syngas in MaxWest's thermal oxidizer process heater is not subject to the SSI EG Rule.

On December 7, 2010, EPA issued an applicability determination under 40 CFR 61, Subpart E, for MaxWest's Sanford fixed bed downdraft gasifier and thermal oxidizer process heater. See enclosure. See also Control Number Z130001 at: www.epa.gov/compliance/monitoring/programs/caa/adi.html. EPA promulgated the Part 61 emissions standards in 1975 under the authority of Section 112 (hazardous air pollutants) that existed at that time and prior to the enactment of Section 129 in the 1990 Clean Air Act Amendments. The provisions of the Part 61 regulations continue to apply as described in that determination and are unrelated to the SSI EG rule.

This response was coordinated with the Office of General Counsel, EPA Region 4, and the Office of Air Quality Planning and Standards, and is based on the information provided by MaxWest and counsel. If you have any additional questions, please contact Marcia Mia of my staff, at: (202) 564-7042 or by email at: mia.marcia@epa.gov.

Sincerely,

Edward J. Messina

Edward Messina, Director
Monitoring, Assistance, and Media Programs Division
Office of Compliance

Enclosure

cc: Bernadette Rappold, McGuire Woods
Cameron Prell, McGuire Woods
Lisa Sharp, McGuire Woods

Message

From: Modak, Nabanita [Modak.Nabanita@epa.gov]
Sent: 8/4/2021 3:40:47 PM
To: Lloyd Winchell [LWinchell@brwncald.com]
CC: Hambrick, Amy [Hambrick.Amy@epa.gov]
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations
Attachments: BFT SSI NSPS 062516.pdf

Hi Lloyd,
Please see the attached letter for BioForceTech. Sometimes it's hard to find the weblink for the letter, that is why I am sending it as an attached copy. All final letters are publicly available documents.

Thanks
Nabanita

From: Lloyd Winchell <LWinchell@brwncald.com>
Sent: Wednesday, August 4, 2021 11:24 AM
To: Hambrick, Amy <Hambrick.Amy@epa.gov>; Modak, Nabanita <Modak.Nabanita@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Thanks Amy, I understand. The other facilities I noted did not have a determination saved on the ADI. I'm a little surprised they would have one yet but again I only have a basic understanding of the permitting process.

Thanks for your help,

Lloyd

Lloyd Winchell
Associate, Environmental Engineer
Brown and Caldwell | Saint Paul, MN
LWinchell@brwncald.com
T 651.468.2051 | **C** 651.212.0526

From: Hambrick, Amy <Hambrick.Amy@epa.gov>
Sent: Wednesday, August 04, 2021 9:56 AM
To: Lloyd Winchell <LWinchell@brwncald.com>; Modak, Nabanita <Modak.Nabanita@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Hi Lloyd,

Yes, at this time, each individual gasification/py unit would need to go through its own formal applicability determination process. As highlighted in my email to Mr. Brady:

"These types of units need to go through case by case formal applicability determinations and provide EPA with specific technical information to determine the unit is not an incinerator and not subject to a 129 rule. Applicability determinations are not rulemaking but rather site specific final agency actions that only apply to the person (facility owner/operator) that the letter is written to. Another facility can use a previously issued determination as guidance only

to make an argument for their specific case/ applicability determination, but they can't use it as a "shield" and they can't use it like a rule. In other words an determination made on my facility cannot be used for your facility. "

I hope this helps,

Amy

From: Lloyd Winchell <LWinchell@brwncald.com>
Sent: Wednesday, August 4, 2021 10:28 AM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Cc: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Thanks again Nabanita.

I was able to find in the index the attached determination for the MaxWest, now Aries, facility setting a precedence for gasification systems. Aries has been using this as evidence for their Taunton, NJ development and probably Linden, NJ which is under construction. I wasn't able to find a determination for either of these facilities in the index. Linden is under construction, so wouldn't they need one? Or, can they use the attached to obtain a construction permit?

I also haven't found any determinations for the BioforceTech (pyrolysis, Redwood City, CA) or Ecoremedy (gasifier, Morristown, PA) facilities. Wouldn't they require a determination?

Lloyd

Lloyd Winchell
Associate, Environmental Engineer
Brown and Caldwell | Saint Paul, MN
LWinchell@brwncald.com
T 651.468.2051 | **C** 651.212.0526

From: Modak, Nabanita <Modak.Nabanita@epa.gov>
Sent: Tuesday, August 03, 2021 4:24 PM
To: Lloyd Winchell <LWinchell@brwncald.com>
Cc: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Hi Lloyd,
Here is a link for the process manual that describes the applicability determination process in EPA.

EPA Process Manual for Responding to Requests Concerning Applicability and Compliance Requirements of Certain Clean Air Act Stationary Source Programs

Also, below is a link for Applicability Determination Index. You can view the past applicability determination letters that have been issue by EPA.

https://cfpub.epa.gov/adi/

Hope you find this information helpful. Please let us know if you have further questions.

Thanks
Nabanita

From: Lloyd Winchell <LWinchell@brwncald.com>
Sent: Tuesday, August 3, 2021 4:56 PM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Cc: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Thanks Nabanita and Amy,

Is there a simplistic guide to the referenced applicability determination? Perhaps a flow sheet or decision tree? I'm a permitting novice at best but I'm trying to provide valuable information in this publication we're working on.

Lloyd

Lloyd Winchell

Associate, Environmental Engineer
Brown and Caldwell | Saint Paul, MN
LWinchell@brwncald.com
T 651.468.2051 | **C** 651.212.0526

From: Modak, Nabanita <Modak.Nabanita@epa.gov>
Sent: Monday, August 02, 2021 4:55 PM
To: Lloyd Winchell <LWinchell@brwncald.com>
Cc: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Hi Lloyd,
I agree with Amy that given the current regulatory construct of HMIWI, CISWI, OSWI, and SSI rules, facilities employing pyrolysis and/or gasification processes have to go through site-specific applicability determination process to see whether these processes are subject to section 129 of the Clean Air Act. However, EPA intends to collect more information and gain a comprehensive understanding on pyrolysis and gasification processes. Based on data and information received, the agency will evaluate the appropriate next steps in regulating pyrolysis and gasification units.

Thanks
Nabanita

From: Hambrick, Amy <Hambrick.Amy@epa.gov>
Sent: Friday, July 30, 2021 11:22 AM
To: Lloyd Winchell <LWinchell@brwncald.com>
Cc: Modak, Nabanita <Modak.Nabanita@epa.gov>
Subject: RE: Gasification/Pyrolysis Air Emissions Regulations

Hi Lloyd,

Thanks for your email. Yes the email I exchanged with Peter Brady is still current and is true for both gasification and pyrolysis. I cc'd Nabanita Modak in case she has anything to add here. Nabanita and I both work on regulation

development of incineration regulations under section 129 of the Clean Air Act. We are always interested in learning more on this topic. Please keep us posted on any results you can share.

Amy

From: Lloyd Winchell <LWinchell@brwncald.com>
Sent: Monday, July 26, 2021 5:41 PM
To: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: Gasification/Pyrolysis Air Emissions Regulations

Hello Ms. Hambrick,

I'm working on some research regarding pyrolysis and gasification processes for sewage sludge. Part of that research includes putting together a publication describing these technologies and providing a brief comparison to incineration. Part of that comparison would include the air emission regulations all of these technologies fall under. Peter Brady had shared the e-mail below between the two of you regarding the EPA's position for gasification, which I would assume applies to pyrolysis as well. I believe Peter solicited your response based on pyrolysis/gasification vendors with permitted facilities advertising their systems as not being considered SSIs and therefore not needing to meet the CAA 129 rules. I assume your response is still valid but I wanted to be certain as I intend to cite it in the publication.

For a little more background on the research, I'm leading a study regarding the fate of PFAS through SSIs funded in part by the Water Research Foundation. Based on the preliminary work for that study we understand the relevant means for PFAS destruction is high temperature processing, and pyrolysis/gasification are the other commercially available technologies to the wastewater industry. So, we initiated a research program which will first produce the said publication. We then plan to distribute this publication to utilities as the background for a survey on the industry interest in these technologies. This second part we plan to collaborate as we can with EPA and have been in contact with Eben Thoma and others in ORD. We've got some bench and full-scale work in progress as well along with another grant application. If you have any questions I'd be happy to talk at your convenience.

Thanks,

Lloyd

========== Forwarded message ==========
From: Hambrick, Amy <Hambrick.Amy@epa.gov>
To: "pbrady@alpinetechnology.com"<pbrady@alpinetechnology.com>
Date: Fri, 23 Apr 2021 10:59:50 -0500
Subject: RE: Gasification exemption & What is a waste
========== Forwarded message ==========

Hi Peter,

Nice talking with you.

We do periodically have other types of units that do not fit into the typical rule subcategories (e.g. FB and MH) that come to EPA requesting formal applicability determinations. These could be situations where there is a question of whether or not incineration is occuring and how the unit may or may not be subject to CAA 129 rules. These determinations are handled on a case-by-case basis. Using gasification as an example…. CAA section 129 rules SSI, CISWI, OSWI, and HMIWI do not offer clear applicability or guidance for gasification units. These types of units need to go through case by case formal applicability determinations and provide EPA with specific technical information to determine the unit is not an incinerator and not subject to a 129 rule. Applicability determinations are not rulemaking but rather site specific final agency actions that only apply to the person (facility owner/operator) that the letter is written to. Another facility can use a previously issued determination as guidance only to make an argument for their specific case/ applicability determination, but they can't use it as a "shield" and they can't use it like a rule. In other words an determination made on my facility cannot be used for your facility.

Another reminder regarding the Identification of Non-Hazardous Secondary Materials That Are Solid Waste . Sewage sludge can be processed and used as a fuel if it meets criteria established by RCRA. In these cases the biosolid fuel may be used as an ingredient for something else e.g., Cement kiln. In other situations, sewage sludge is combusted in other types of incinerators other than those at waste water treatment plants. For these two scenarios, CAA 112 rules may apply or other CAA 129 rules. See under "W" Waster Determinations.
Please let me know if you would like to discuss further. I do hope this email is helpful.

Amy

Lloyd Winchell

Associate, Environmental Engineer
Brown and Caldwell | Saint Paul, MN
LWinchell@brwncald.com
T 651.468.2051 | **C** 651.212.0526

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JUL 25 2016

Dario Presezzi
CEO, BIOFORCETECH Corporation
1400 Radio Road
Redwood City, California 94065

Dear Mr. Presezzi:

The BIOFORCETECH Corporation (BFT) has developed a pyrolysis system ("PYREG") to be used at a biosolids to energy facility inside a municipal wastewater treatment plant designed to treat domestic sewage sludge operated by Silicon Valley Clean Water and located in Redwood City, California. According to BFT, the PYREG includes (1) a pyrolysis reactor, where the biosolids are heated to 550-650°C without the addition or presence of air or oxygen, to produce syn-gas; (2) a "flameless" oxidation burner (FLOX®) where the syn-gas is combusted and (3) a heat exchanger and exhaust cleaning system for the gases leaving the annular space between the central tube and the outer shell of the reactor and which are then discharged to the atmosphere. BFT submitted a letter to EPA on January 8, 2016 regarding the applicability of 40 C.F.R. Part 60 Subpart LLLL Standards of Performance for New Sewage Sludge Incineration Units, (SSI NSPS), to the BFT pyrolysis system. BFT sent a revised version of the letter with additional details and a formal request for applicability on March 16, 2016. BFT provided additional information to EPA in an email dated March 2, 2016. For the reasons discussed below, we do not believe that the BFT PYREG system is a sewage sludge incineration unit subject to the SSI NSPS.

The SSI NSPS establishes new source performance standards for sewage sludge incineration (SSI) units at §60.4760 and includes the following definitions and requirements:

> *Your SSI unit is an affected source if it meets all the criteria specified in paragraphs (a) through (c) of this section.*
>
> > *(a) Your SSI unit is a SSI unit for which construction commenced after October 14, 2010 or for which modification commenced after September 21, 2011.*
> > *(b) Your SSI unit is a SSI unit as defined in §60.4930.*
> > *(c) Your SSI unit is not exempt under §60.4780.*

The SSI NSPS also includes the following definitions at § 60.4930:

> *Sewage sludge incineration (SSI) unit means an incineration unit combusting sewage sludge for the purpose of reducing the volume of the sewage sludge by removing combustible matter. Sewage sludge incineration unit designs include fluidized bed and multiple hearth. A SSI unit also includes, but is not limited to, the sewage sludge feed system, auxiliary fuel feed system, grate system, flue gas system, waste heat recovery equipment, if any, and bottom ash system. The SSI unit includes all ash handling systems connected to the bottom ash handling system. The combustion unit bottom ash system ends at the truck loading station or similar equipment that transfers the ash to final disposal. The SSI unit does not include air pollution control equipment or the stack.*

Sewage sludge means solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incineration unit or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.

The SSI NSPS does not include definitions for incineration or combustion. The preamble to the March 21, 2011 final NSPS rule, at 76 Federal Register 15,376, provides a further description as to what constitutes an SSI unit:
"[a] SSI unit is an enclosed device or devices using controlled flame combustion that burns sewage sludge for the purpose of reducing the volume of the sewage sludge by removing combustible matter."

BFT describes that during startup, before sewage sludge is introduced, the temperature raises gradually from ambient temperature to the process temperature using the exhaust gas from the FLOX that flows on the outside wall of the reactor. The temperature profile provided by BFT in the March 16, 2016 revised letter confirms this and also shows that the temperature drops when the sewage sludge is fed to the reactor (at the 45 minute mark) and does not recover to startup levels. BFT further state that, "no flame is present, applied to or propagated into the pyrolysis unit, and the absence of Oxygen prevents combustion inside the pyrolysis unit." BFT also confirmed that two air-tight valves are used to transfer biosolids into the pyrolysis unit, ensuring that no air is able to enter the reactor. The syn-gas is forced from the pyrolysis reactor through a section of insulated pipe, into an insulated cyclone and then a second section of insulated pipe before it is introduced into the combustion chamber.

EPA determines, based on the information provided and statements made by BFT, that:

1. The pyrolysis reactor in the BFT process is not a SSI unit as that term is defined in the SSI NSPS, because there is no flame in the pyrolysis reactor; and
2. The syn-gas is a gas and is not a solid, semi-solid or liquid. Therefore the syn-gas is not sewage sludge (even though it is derived from sewage sludge) as that term is defined in the SSI NSPS; therefore the FLOX® chamber is not combusting sewage sludge and therefore also not an SSI unit.

Consequently, the BFT pyrolysis system is not subject to the requirements in the SSI NSPS.

This response has been coordinated with EPA Region 9, Office of Compliance and Office of Air Quality Planning and Standards. Please contact Charles Aldred at 415.972.3986 or aldred.charles@epa.gov with any questions about this determination.

Sincerely,

Matt Salazar, P.E.
Manager, Air & TRI Section
Enforcement Division

cc: Alfonso Borja, Bay Area AQMD (pdf)

Message

From: Modak, Nabanita [Modak.Nabanita@epa.gov]
Sent: 6/18/2019 6:58:47 PM
To: Elter, Thomas (DEC) [thomas.elter@dec.ny.gov]
CC: Gardella, Anthony [Gardella.Anthony@epa.gov]; Mia, Marcia [Mia.Marcia@epa.gov]
Subject: RE: animal crematories

Tom,
Yes, request for an AD is the right approach. Thanks for leading them in the right direction. EPA will keep you posted.

Thanks
Nabanita

-----Original Message-----
From: Elter, Thomas (DEC) <thomas.elter@dec.ny.gov>
Sent: Tuesday, June 18, 2019 2:04 PM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Cc: Gardella, Anthony <Gardella.Anthony@epa.gov>; Mia, Marcia <Mia.Marcia@epa.gov>
Subject: RE: animal crematories

Nabanita,

I have recommended that the consultant submit to the EPA an applicability determination. The DEC does not have any information from the facility other than what I have provided you: 10 to 15 tons of animal bedding a week.

Please involve me in your analysis, if you are ever faced with one from this guy.

Tom

-----Original Message-----
From: Modak, Nabanita [mailto:Modak.Nabanita@epa.gov]
Sent: Tuesday, June 18, 2019 1:51 PM
To: Elter, Thomas (DEC) <thomas.elter@dec.ny.gov>
Cc: Gardella, Anthony <Gardella.Anthony@epa.gov>; Mia, Marcia <Mia.Marcia@epa.gov>
Subject: RE: animal crematories

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It could be. I am not ruling out any options here. Is the research facility a commercial facility , producing a product and marketing the product? I think a call between you and EPA will be more effective and efficient way to address this issue. Please let me know if a call is necessary.

Thanks
Nabanita

-----Original Message-----
From: Elter, Thomas (DEC) <thomas.elter@dec.ny.gov>
Sent: Tuesday, June 18, 2019 1:23 PM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Cc: Gardella, Anthony <Gardella.Anthony@epa.gov>; Mia, Marcia <Mia.Marcia@epa.gov>
Subject: RE: animal crematories

Why wouldn't it be CISWI?

-----Original Message-----
From: Modak, Nabanita [mailto:Modak.Nabanita@epa.gov]
Sent: Tuesday, June 18, 2019 11:52 AM
To: Elter, Thomas (DEC) <thomas.elter@dec.ny.gov>
Cc: Gardella, Anthony <Gardella.Anthony@epa.gov>; Mia, Marcia <Mia.Marcia@epa.gov>
Subject: RE: animal crematories

ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Based on the limited information provided through e-mails, my guess is the incinerator located in the facility has a possibility to become an institutional waste incinerator under the OSWI rule. Please note that we will require detailed information in order for us to accurately characterize the incinerator and the regulatory applicability.

-----Original Message-----
From: Elter, Thomas (DEC) <thomas.elter@dec.ny.gov>
Sent: Tuesday, June 18, 2019 10:48 AM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Cc: Gardella, Anthony <Gardella.Anthony@epa.gov>; Mia, Marcia <Mia.Marcia@epa.gov>
Subject: RE: animal crematories

The facility is a medical research facility in the Syracuse area that generates 10-12 tons of rodent litter each week. It consists of both rodent waste and wood shavings. They are not proposing a crematory in the sense that it is incinerating mostly pathological waste.

-----Original Message-----
From: Modak, Nabanita [mailto:Modak.Nabanita@epa.gov]
Sent: Tuesday, June 18, 2019 10:37 AM
To: Elter, Thomas (DEC) <thomas.elter@dec.ny.gov>
Cc: Gardella, Anthony <Gardella.Anthony@epa.gov>; Mia, Marcia <Mia.Marcia@epa.gov>
Subject: RE: animal crematories

ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Hi Tom,
Under the OSWI rule (2005), animal crematories are exempted. Because, these units burn 90 percent or more by weight (on a calendar quarter basis and excluding the weight of auxiliary fuel and combustion air) of pathological waste. Pathological waste is defined as waste material consisting of only human or animal remains, anatomical parts, and/or tissue, the bags/containers used to collect and transport the waste material, and animal bedding (if applicable) (70 FR 74904). Therefore if a unit does not burn 90% of pathological waste, the exemption goes away. Coming to your 2nd question, is this primarily an industrial facility that decided to burn rodent bedding materials? Or, this is an animal crematory? More details will help us address your questions accurately.

Thanks
Nabanita

-----Original Message-----
From: Elter, Thomas (DEC) <thomas.elter@dec.ny.gov>
Sent: Tuesday, June 18, 2019 8:17 AM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Subject: animal crematories

Hi Nabanita

Hope all is well!

1. How are animal crematories treated under EPA's incinerator rules?

1. I have a facility that wants to incinerate 15 tons of rodent bedding material a week. My interpretation is that incineration of this waste would be subject to CISWI. Is that correct?

Tom

Tom Elter
Regional Air Pollution Control Engineer
Professional Engineer 2, Division of Air Resources

New York State Department of Environmental Conservation
615 Erie Boulevard West, Syracuse, NY 13204
P: (315) 426-7470 | F: (315) 426-7487 | thomas.elter@dec.ny.gov<mailto:thomas.elter@dec.ny.gov>
www.dec.ny.gov<http://www.dec.ny.gov/> | [cid:image001.jpg@01D525AE.39FAC290]
<https://www.facebook.com/NYSDEC> | [cid:image002.png@01D525AE.39FAC290] <https://twitter.com/NYSDEC> |
[cid:image003.png@01D525AE.39FAC290] <https://www.instagram.com/nysdec/>

Message

From: TSAI, YA-TING [Tsai.Ya-Ting@epa.gov]
Sent: 1/17/2020 1:06:48 AM
To: Todd Martin (AQD) [Todd.Martin@maricopa.gov]; Scott Treece (AQD) [Scott.Treece@Maricopa.gov]
CC: BECKHAM, LISA [BECKHAM.LISA@EPA.GOV]; Modak, Nabanita [Modak.Nabanita@epa.gov]; Mia, Marcia [Mia.Marcia@epa.gov]; Spells, Charlene [Spells.Charlene@epa.gov]
Subject: FW: Renewlogy P2E Project

Hi Todd and Scott,

Please see below for response for the Renewology Project. Hope this helps with your meeting tomorrow.

Thanks,

Sheila Tsai
Air Permits Section (AIR-3-1)
415-972-3328

From: Modak, Nabanita <Modak.Nabanita@epa.gov>
Sent: Thursday, January 16, 2020 5:00 PM
To: TSAI, YA-TING <Tsai.Ya-Ting@epa.gov>
Cc: Mia, Marcia <Mia.Marcia@epa.gov>; Spells, Charlene <Spells.Charlene@epa.gov>
Subject: RE: Renewlogy P2E Project

EPA Region 9 received an e-mail from Maricopa County Air Quality department on August 1, 2019 that stated that Renewology is planning to install a plastics-to-fuel plant near a City of Phoenix recycling facility, essentially using pyrolysis to convert plastic to fuel. The maximum capacity of the plant is 10 tons per day. Their position is that the recycled plastic is a commodity feedstock and not a solid waste. The county reached out to EPA to get some guidance on the applicability of Subparts EEEE to this project. EPA did not receive any technical details such as process flow diagram, process description, equipment specifications, site lay out and etc. about this particular project. However, EPA received technical details about a similar project that has been proposed to be constructed and operated by Sustane Chester Inc. (Sustane) in Canada. The Project will be located within the Municipality of the District of Chester (MODC), approximately 20 km north of the town of Chester, NS at the existing Kaizer Meadow Environmental Management Centre (KMEMC), in Sherwood, on a 4.99 ha parcel of land (PID 60704418) registered under the Municipality of the District of Chester and leased by Sustane. EPA has reviewed the technical details of Sustane project details and based on those details EPA does not believe subpart EEEE applies to Renewlogy - Waste Plastic-to-Fuel System near a City of Phoenix recycling facility.

Subpart EEEE does not define pyrolysis /combustion units. However, 70 FR 74876 and 70 FR 74877 specifies that pyrolysis/combustion units (two chamber incinerators with a starved air primary chamber followed by an afterburner to complete combustion) within the VSMWC and IWI subcategories are considered OSWI units. However, the process description / technical details described in the Sustane document indicates that the primary chamber (primary and secondary reformers as described in the document) is not followed by an after burner or thermal oxidizer. Instead, primary chamber is followed by a condenser and excess gas from condenser is routed to a thermal oxidizer. The document describes that the Condenser receives the Reformer Gas after undergoing pyrolysis in the Primary and Secondary Reformers. Gas which passes through the condensing stages is mainly composed of propane and methane and is considered a NCG. NCG is then utilized within the process and excess NCG sent to the thermal oxidizer (Section 2.4.9) for destruction. Based on this information, EPA believes the primary chambers (primary and secondary reformers) and the afterburner (here, thermal oxidizer) are not closely coupled and therefore the unit will not be subject to subpart EEEE.

Please note this guidance only based on information received about Sustane unit, which may or may not be what Renewology ultimately constructs in Maricopa County.

Thanks

Message

From: Todd Martin (AQD) [Todd.Martin@maricopa.gov]
Sent: 1/17/2020 3:15:27 PM
To: TSAI, YA-TING [Tsai.Ya-Ting@epa.gov]; Scott Treece (AQD) [Scott.Treece@Maricopa.gov]
CC: BECKHAM, LISA [BECKHAM.LISA@EPA.GOV]; Modak, Nabanita [Modak.Nabanita@epa.gov]; Mia, Marcia [Mia.Marcia@epa.gov]; Spells, Charlene [Spells.Charlene@epa.gov]
Subject: RE: Renewlogy P2E Project

Thanks again for all your help everyone!

Todd Martin • Permitting Supervisor
Maricopa County Air Quality Department
Desk: 602.506.7248 | CleanAirMakeMore.com
Burn Cleaner, Burn Better.On No Burn Days, Don't Burn Wood.

From: TSAI, YA-TING <Tsai.Ya-Ting@epa.gov>
Sent: Thursday, January 16, 2020 6:07 PM
To: Todd Martin (AQD) <Todd.Martin@maricopa.gov>; Scott Treece (AQD) <Scott.Treece@Maricopa.gov>
Cc: BECKHAM, LISA <BECKHAM.LISA@EPA.GOV>; Modak, Nabanita <Modak.Nabanita@epa.gov>; Mia, Marcia <Mia.Marcia@epa.gov>; Spells, Charlene <Spells.Charlene@epa.gov>
Subject: FW: Renewlogy P2E Project

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Sheila Tsai
Air Permits Section (AIR-3-1)
415-972-3328

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To: TSAI, YA-TING <Tsai.Ya-Ting@epa.gov>
Cc: Mia, Marcia <Mia.Marcia@epa.gov>; Spells, Charlene <Spells.Charlene@epa.gov>
Subject: RE: Renewlogy P2E Project

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Please note this guidance only based on information received about Sustane unit, which may or may not be what Renewology ultimately constructs in Maricopa County.

Thanks

Message

From: Hanlon, Lisa [Hanlon.Lisa@epa.gov]
Sent: 9/9/2020 1:53:33 PM
To: Osborne, Russell [Russell.Osborne@dnr.mo.gov]
CC: Modak, Nabanita [Modak.Nabanita@epa.gov]
Subject: RE: OSWI Rule Questions

Hi Russell:
I talked to Nabanita at OAQPS.
1. Is the facility working with a government entity or is it a commercial entity? For instance, we've seen this in the wildfire cleanup in the California wildfire and forestry product which would be government and OSWI.
2. What is the facility combusting? Is it all forestry product?
3. What is the combustion product? Does it have market value?

This would help with the determination for Section 129.
Thanks,
Lisa H

Lisa Hanlon
Air Compliance
U.S. EPA Region 7
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7599
hanlon.lisa@epa.gov

From: Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Sent: Thursday, September 03, 2020 11:36 AM
To: Hanlon, Lisa <Hanlon.Lisa@epa.gov>
Subject: RE: OSWI Rule Questions

Hello Lisa,

I hope all is still well with you. I was checking to see if you had any updates for the C2G CISWI determination.

Thank you for your time,
Russell Osborne

From: Osborne, Russell
Sent: Thursday, July 9, 2020 12:53 PM
To: 'Hanlon, Lisa' <Hanlon.Lisa@epa.gov>
Subject: RE: OSWI Rule Questions

Good afternoon Lisa,

Absolutely! That is perfect. I just wanted to be able to provide an update for the installation if they ask. I appreciate your efforts.

Thank you,
Russell Osborne

From: Hanlon, Lisa
Sent: Thursday, July 9, 2020 12:24 PM
To: Osborne, Russell
Cc: Queiroz, Gustavo
Subject: RE: OSWI Rule Questions

Hi Russell:
I checked with HQ and they have received an applicability determination (they think from this company) as well. They are under court order deadline to get the OSWI rule out by end of July, so it will be a couple of weeks before they can get to this. I hope that's okay
Lisa

Lisa Hanlon
Air Compliance
U.S. EPA Region 7
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7599
hanlon.lisa@epa.gov

From: Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Sent: Wednesday, July 08, 2020 11:38 AM
To: Hanlon, Lisa <Hanlon.Lisa@epa.gov>
Cc: Queiroz, Gustavo <queiroz.gustavo@epa.gov>
Subject: RE: OSWI Rule Questions

Hi Lisa,

I was curious if you had found out anymore guidance pertaining to the portable air curtain incinerator?

Thank you for your time,
Russell

From: Hanlon, Lisa <Hanlon.Lisa@epa.gov>
Sent: Tuesday, June 23, 2020 2:46 PM
To: Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Cc: Queiroz, Gustavo <queiroz.gustavo@epa.gov>
Subject: RE: OSWI Rule Questions

Hi Russell:
At first glance, this looks like a CISWI unit to me. Unless it's owned by a municipality or other governmental entity, in which it would be an OSWI unit. I'm double checking with HQ who may have some more insight into this type of combustion just in case I'm missing something.
Lisa

Lisa Hanlon

Air Compliance
U.S. EPA Region 7
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7599
hanlon.lisa@epa.gov

From: Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Sent: Monday, June 22, 2020 6:13 PM
To: Hanlon, Lisa <Hanlon.Lisa@epa.gov>
Subject: RE: OSWI Rule Questions

Hi Lisa,

I believe you have previously helped me with a tire pyrolysis question. I hope all is well.

I am now working on a project where the installation is using a ROI Carbonator 500, I have attached a flyer about the equipment for clarity purposes. The proposed process will use 100% clean Missouri hardwood obtained from the installation harvesting themselves as well as receiving materials from local tree service companies. The equipment is to operate at 2500 degrees Fahrenheit. The manufactures claim, at this temperature, although air is forced into the equipment the combustion process is still starved for air. This allows roughly 5% of the feed to undergo pyrolysis. The recovered char will be sold as soil supplement. The installation is proposing to be portable with sites located in Liberty, Springfield, and O' Fallon, Missouri.

I have read through the OSWI rules and understand that ACI's are regulated in §60.2970 - §60.2974. It is my understanding however there may be some guidance out there stating that this process is not considered an ACI. I am unsure as to how to classify the equipment. I have read the definitions in Subpart E and Subpart CCCC and just want to be sure of myself as this is a unique process.

Thank you for your time,
Russell Osborne

From: Hanlon, Lisa <Hanlon.Lisa@epa.gov>
Sent: Monday, June 22, 2020 7:41 AM
To: Cheever, Robert <cheever.robert@epa.gov>; Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Subject: RE: OSWI Rule Questions

Except that's a typo. My number is 7599, but it's often easier to put it in an email so I get the details straight and can respond without having to ask for more info.
Lisa H

Lisa Hanlon
Air Compliance
U.S. EPA Region 7
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7599
hanlon.lisa@epa.gov

From: Cheever, Robert <cheever.robert@epa.gov>
Sent: Monday, June 22, 2020 5:43 AM

To: Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Cc: Hanlon, Lisa <Hanlon.Lisa@epa.gov>
Subject: RE: OSWI Rule Questions

Russell,

Lisa Hanlon at 913-551-7968 or hanlon.lisa@epa.gov is the Region 7 OSWI point of contact.

Bob Cheever

From: Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Sent: Friday, June 19, 2020 3:13 PM
To: Cheever, Robert <cheever.robert@epa.gov>
Subject: OSWI Rule Questions

Hello Mr. Cheever,

My name is Russell Osborne I work for the MDNR Air Pollution Control Program. I had some guidance questions for a project and Kendall told me you could point me in the right direction. I was wanting some clarity on the OSWI rules. Who is the EPA Region 7 contact for OSWI rule questions?

Thank you for your time,

Russell Osborne, E.I.T.
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102
Phone: 573-526-1545

Message

From: Hanlon, Lisa [Hanlon.Lisa@epa.gov]
Sent: 6/23/2020 1:27:53 PM
To: Modak, Nabanita [Modak.Nabanita@epa.gov]; Stahl, Cynthia [Stahl.Cynthia@epa.gov]
CC: Osborne, Russell [Russell.Osborne@dnr.mo.gov]
Subject: CISWI unit? Carbonator 500
Attachments: CARBONATOR-500-FLYER_.pdf

Hi Nabanita:
Missouri has been requested to permit the attached unit. It sure quacks like a CISWI unit to me (assuming it's a commercial facility), but the outfit is based in New Hampshire and I thought somebody outside Region 7 may have seen this thing before.
Cynthia – can we get the flyer added to today's agenda please? I know it's a late addition… ☺
Lisa

Lisa Hanlon
Air Compliance
U.S. EPA Region 7
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7599
hanlon.lisa@epa.gov

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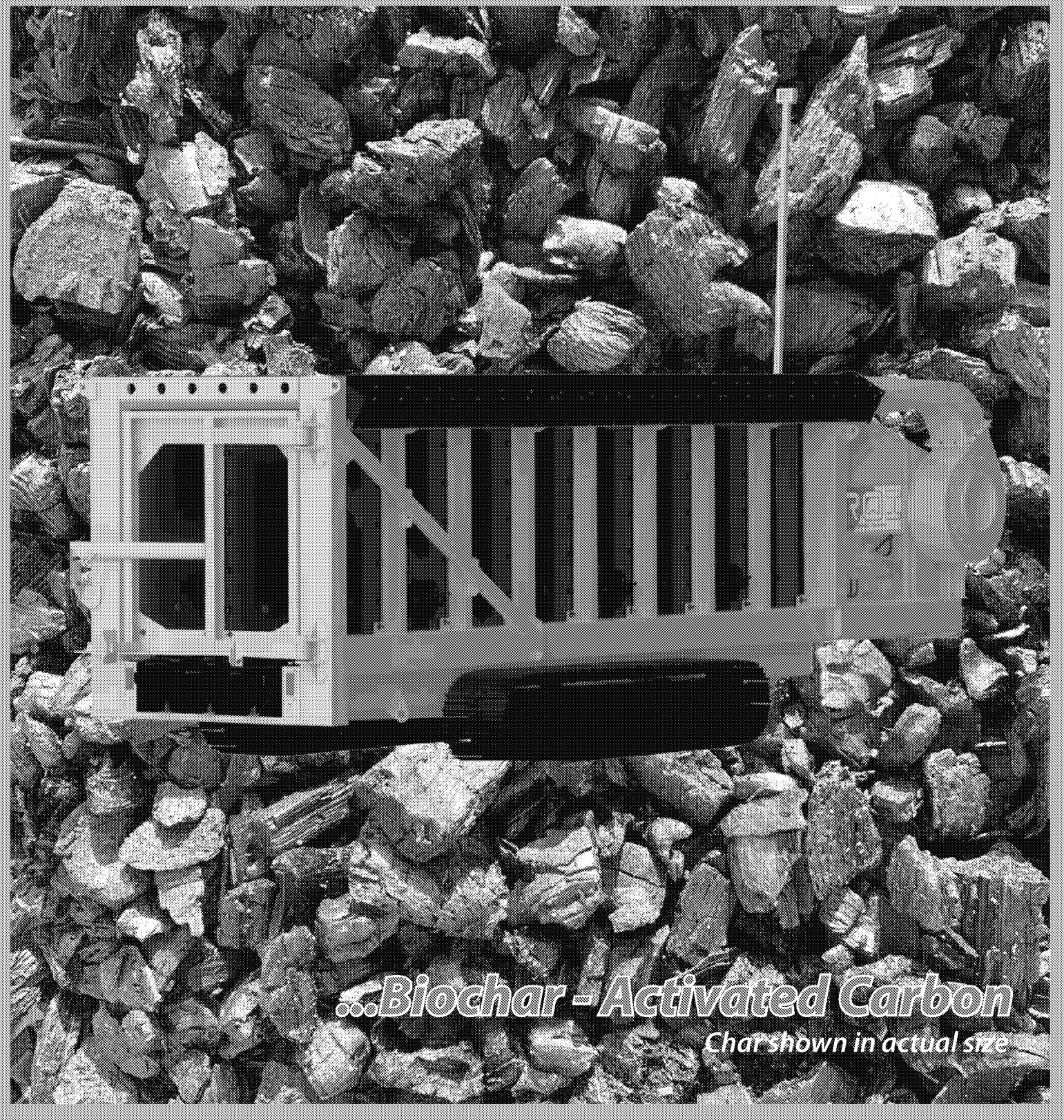
Thank you for your time,
Russell Osborne, E.I.T.
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102
Phone: 573-526-1545

CARBONATOR™ 500

Mobile Carbonizer

ROI's Revolutionary Carbon Negative Solution to Cost Effective Conversion of Wood Debris to...

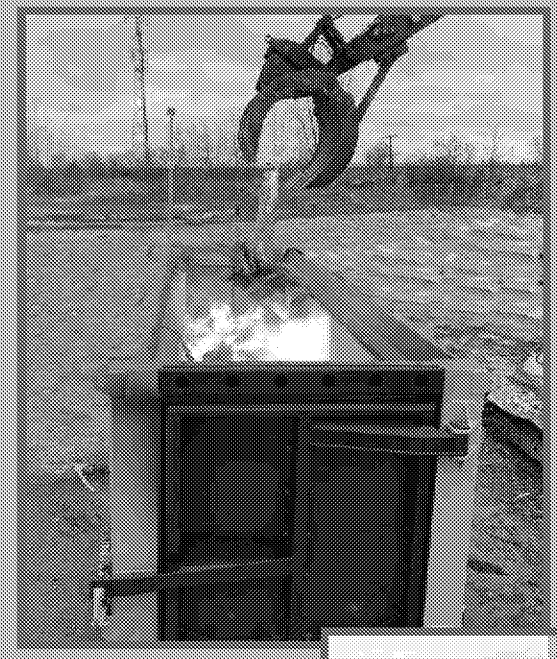


CARBONATOR™ 500

Mobile Carbonizer

The Future of Wood and Vegetative Debris Conversion

The mobile and stationary CARBONATOR is the most advanced, cost-effective and environment- friendly wood debris conversion system ever built. Wood and other suitable biomass is converted into a high-quality biochar at high throughput rates, utilizing the biomass as its own fuel source for Carbonizing. Designed to accept trees, brush, stumps and other wood debris without grinding or chipping.

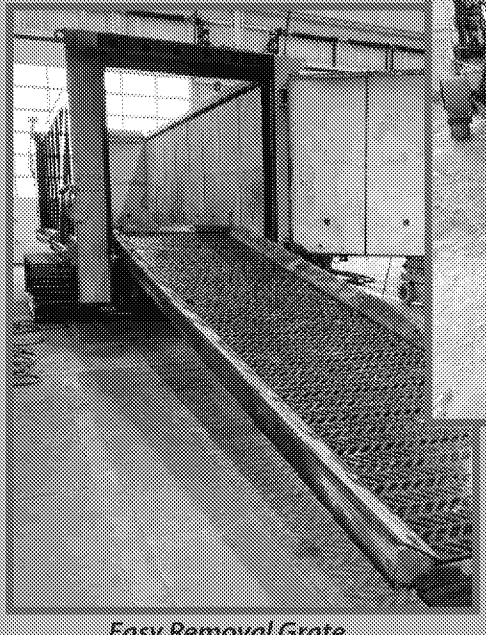


Large Open Feed Area

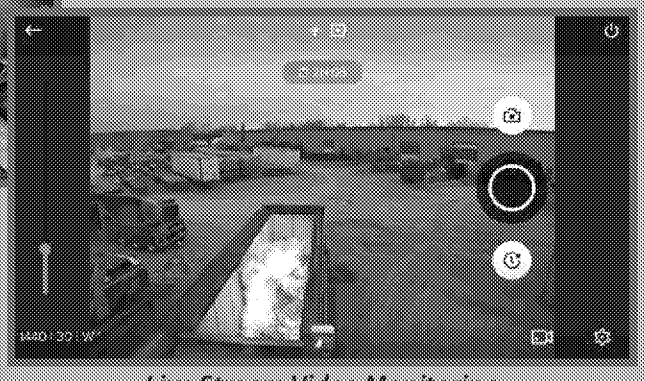
CARBONATOR Benefits

- The wood and vegetative debris are the fuel supply for the carbonizing process.
- Designed to provide the largest transportable mobile machine for high sustainable processing capacity and superior end product.
- Track mounted to allow for direct re-introduction of high-quality biochar to forest or agricultural land where conversion is taking place.
- Designed to be easily moved on common lowboy trailers.
- Pre-heated under chamber air for maximum conversion efficiency.
- Live stream video monitoring of carbonizing chamber providing operator full visibility for ease of feeding.
- Extremely low operating cost, simple and easy single person operation.
- Eliminates processing, transportation and disposal costs.
- A natural process that converts biomass into a high-quality product.

Char Conveyor with Metal Separation



Easy Removal Grate



Live Stream Video Monitoring

CARBONATOR™ 500

Mobile Carbonizer

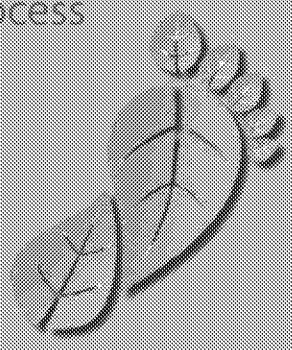
ROI's team spent the last few years designing and constructing the carbonizer line of equipment to address the challenges associated with reducing the carbon process footprint from commonly accepted, but in reality, poor management of wood debris.

ROI's patent pending Carbon Negative Process is the only available Single-Step recycling system that reduces the processing carbon footprint to less than neutral, having a net effect of removing CO_2e emissions from the atmosphere. All other available processes add CO_2e emissions, some much more significant than others.

The CARBONATOR 500's carbon negative technology properly reduces volume by approximately 90% while recycling debris into a valuable high grade Activated Carbon or Biochar, based on the customers desired material outcome.

Carbon Process Footprint Comparisons:

When wood and vegetation is converted to biochar utilizing the CARBONATOR 500 the process footprint is **NEGATIVE**, 240-330lb of Atmospheric CO_2e is **reduced** per ton of carbonized debris.
PM: 1-2lb./ton



When wood and vegetation is turned in to compost, the Carbon Process Footprint is **Positive**, 2,000-2300lb of Atmospheric CO_2e is **added** per ton of composted debris.
PM: 15-20lb./ton

When wood and vegetation is turned in to mulch, the Carbon Process Footprint is **Positive**, 2,000-2300lb of Atmospheric CO_2e is **added** per ton of mulch produced.
PM: 30-40lb./ton

When wood and vegetation is turned in to and used for fuel for heat/electric generation, the Carbon Process Footprint is **Positive**, 50-100lb of Atmospheric CO_2e is **added** per ton of combusted fuel.
PM: 15-20lb./ton

When wood and vegetation is landfilled while used as daily cover the Carbon Process Footprint is **Positive**, 2,000-2100lb of Atmospheric CO_2e is **added** per ton of raw material processed and deposited.
PM: 15-20lb./ton

When wood and vegetation is directly landfilled, the Carbon Process Footprint is **Positive**, 1,900-2050 lb. of Atmospheric CO_2e is **added** per ton of deposited material.
PM: 2-3lb./ton

Biochar Benefits

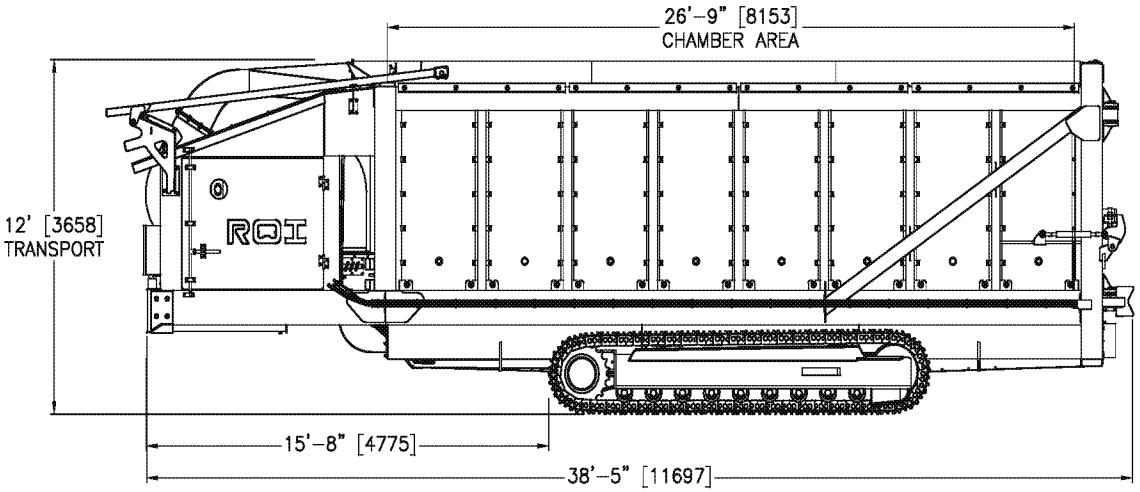
Biochar is the solid product remaining after the biomass is carbonized. Biochar is characterized by high porosity and a high-specific surface area. The porosity and surface area give biochar very favorable properties for adsorption of toxic substances and soil rehabilitation. Biochar sequesters carbon for thousands of years and is resistant to the microbial breakdown that is common with other types of organic matter.

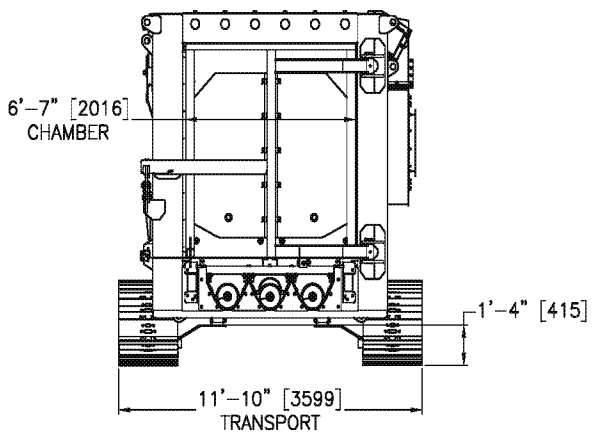
Biochar has many uses, a few notable applications include, Micro-filters, Carbon fertilizer, Compost additive, Substitute for peat in potting soil, Plant protection, and a process to reduce particulate, Carbon Dioxide (CO_2), Methane (CH_4) and Nitrous Oxides (NO_x) emissions from other biomass processes.

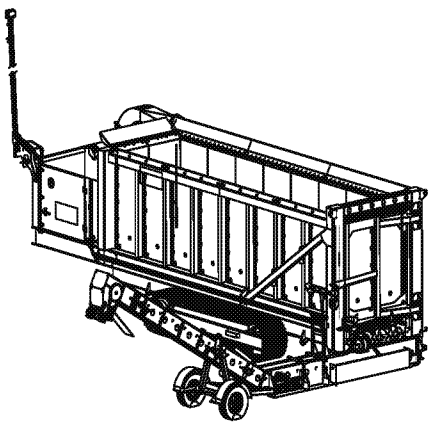
*The above emissions values were calculated using published data from the US EPA and other sources.

CARBONATOR™ 500

Mobile Carbonizer







Patent Pending

CARBONATOR 500 Specifications:

Thermo-Ceramic Panels:
Bolt in easily replaceable panels rated to 1650 degrees C. (3000 degrees F.)

Blower:
Two hydrostatic driven blowers for maximum carbonizing control and efficiency.

Engine:
Caterpillar tier 2 / tier 4 (124-148hp.)

Tracks:
Berco B5 with two speed motors, 700mm (27.5") wide track pads.

Hydraulic System:
High pressure hydrostatic and open loop piston pumps for blowers and all other functions. 250 liter (55gallon) oil reservoir, oil cooler.

Char Handling System:
One rear carbonizing chamber access door. Three horizontal biochar augers that discharge out the rear of machine. Air cooled char troughs with water injection nozzles for instant quenching of char. Quick interchangeable grates for various size biochar and easy clean out of non-combustibles.

Electrical System:
IQAN PLC with radio remote control for all functions. Camera mounted on hydraulically operated arm to stream video to monitor in cab of machine feeding.

Total Weight:
39643-41500Kg (87400-91300lbs.)

Fuel Tank:
465 Liters (123 gallons)

Optional:
Heat exchanger for water or oil, ORC electric generating module. Automatic propane ignition system, available stationary with electric drives.

ROI

RAGNAR / ORIGINAL INNOVATION

P.O. Box 348 Chester, NH 03036
Phone: (603) 244-7081 www.roi-equipment.com

Message

From: Stahl, Cynthia [Stahl.Cynthia@epa.gov]
Sent: 6/23/2020 1:30:29 PM
To: Hanlon, Lisa [Hanlon.Lisa@epa.gov]; Modak, Nabanita [Modak.Nabanita@epa.gov]
CC: Osborne, Russell [Russell.Osborne@dnr.mo.gov]
Subject: RE: CISWI unit? Carbonator 500

Hi Lisa, Sure, I'll add this and send a modified agenda. C

Cynthia Stahl, PhD.
U.S. Environmental Protection Agency Region III
Permits Branch (3AD10)
Air and Radiation Division
1650 Arch Street
Philadelphia, PA 19103
215-814-2180
stahl.cynthia@epa.gov

From: Hanlon, Lisa <Hanlon.Lisa@epa.gov>
Sent: Tuesday, June 23, 2020 9:28 AM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>; Stahl, Cynthia <Stahl.Cynthia@epa.gov>
Cc: Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Subject: CISWI unit? Carbonator 500

Hi Nabanita:
Missouri has been requested to permit the attached unit. It sure quacks like a CISWI unit to me (assuming it's a commercial facility), but the outfit is based in New Hampshire and I thought somebody outside Region 7 may have seen this thing before.
Cynthia – can we get the flyer added to today's agenda please? I know it's a late addition… ☺
Lisa

Lisa Hanlon
Air Compliance
U.S. EPA Region 7
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7599
hanlon.lisa@epa.gov

From: Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Sent: Monday, June 22, 2020 6:13 PM
To: Hanlon, Lisa <Hanlon.Lisa@epa.gov>
Subject: RE: OSWI Rule Questions

Hi Lisa,

I believe you have previously helped me with a tire pyrolysis question. I hope all is well.

I am now working on a project where the installation is using a ROI Carbonator 500, I have attached a flyer about the equipment for clarity purposes. The proposed process will use 100% clean Missouri hardwood obtained from the installation harvesting themselves as well as receiving materials from local tree service companies. The equipment is to operate at 2500 degrees Fahrenheit. The manufactures claim, at this temperature, although air is forced into the equipment the combustion process is still starved for air. This allows roughly 5% of the feed to undergo pyrolysis. The recovered char will be sold as soil supplement. The installation is proposing to be portable with sites located in Liberty, Springfield, and O' Fallon, Missouri.

I have read through the OSWI rules and understand that ACI's are regulated in §60.2970 - §60.2974. It is my understanding however there may be some guidance out there stating that this process is not considered an ACI. I am unsure as to how to classify the equipment. I have read the definitions in Subpart E and Subpart CCCC and just want to be sure of myself as this is a unique process.

Thank you for your time,
Russell Osborne

From: Hanlon, Lisa <Hanlon.Lisa@epa.gov>
Sent: Monday, June 22, 2020 7:41 AM
To: Cheever, Robert <cheever.robert@epa.gov>; Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Subject: RE: OSWI Rule Questions

Except that's a typo. My number is 7599, but it's often easier to put it in an email so I get the details straight and can respond without having to ask for more info.
Lisa H

Lisa Hanlon
Air Compliance
U.S. EPA Region 7
11201 Renner Blvd.
Lenexa, KS 66219
913-551-7599
hanlon.lisa@epa.gov

From: Cheever, Robert <cheever.robert@epa.gov>
Sent: Monday, June 22, 2020 5:43 AM
To: Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Cc: Hanlon, Lisa <Hanlon.Lisa@epa.gov>
Subject: RE: OSWI Rule Questions

Russell,

Lisa Hanlon at 913-551-7968 or hanlon.lisa@epa.gov is the Region 7 OSWI point of contact.

Bob Cheever

From: Osborne, Russell <Russell.Osborne@dnr.mo.gov>
Sent: Friday, June 19, 2020 3:13 PM
To: Cheever, Robert <cheever.robert@epa.gov>
Subject: OSWI Rule Questions

Hello Mr. Cheever,

My name is Russell Osborne I work for the MDNR Air Pollution Control Program. I had some guidance questions for a project and Kendall told me you could point me in the right direction. I was wanting some clarity on the OSWI rules. Who is the EPA Region 7 contact for OSWI rule questions?

Thank you for your time,

Russell Osborne, E.I.T.
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102
Phone: 573-526-1545

Message

From: Zach Brenton [zach.brenton@carolinaseedsystems.com]
Sent: 1/6/2021 6:58:55 PM
To: Hambrick, Amy [Hambrick.Amy@epa.gov]
CC: Modak, Nabanita [Modak.Nabanita@epa.gov]
Subject: Re: Bio solids incineration questions

Hey thank you so much for providing these documents. Very helpful

Sent from my iPhone

On Jan 6, 2021, at 12:07 PM, Hambrick, Amy <Hambrick.Amy@epa.gov> wrote:

Zach,

As mentioned, here are some things you will want to research:

- <!--[if !supportLists]--><!--[endif]-->RCRA Waste Definition and from this site see the link to "Part 241 Rule Clarifications and Response Letters"
- <!--[if !supportLists]--><!--[endif]-->Applicability determination example : this is for a Py-unit taking hospital waste, while different than what you describe I want to provide you a related example for an other CAA section 129 rule
- <!--[if !supportLists]--><!--[endif]-->SSI website
- <!--[if !supportLists]--><!--[endif]-->CISWI website
- <!--[if !supportLists]--><!--[endif]-->OSWI website

Happy to discuss further,

Amy

From: Hambrick, Amy
Sent: Wednesday, January 6, 2021 11:36 AM
To: Zach Brenton <zach.brenton@carolinaseedsystems.com>
Cc: Modak, Nabanita <Modak.Nabanita@epa.gov>
Subject: RE: Bio solids incineration questions

Hi Zach,

Thanks for your email. The SSI standards are dependent on the incineration unit being located at the wastewater treatment facility. If a unit is for example located 1 mile away from the waste water treatment facility at a separate facility and sludge is trucked the 1 mile for incineration disposal, then another CAA section 129 rule would most likely apply, e.g. the Commercial Solid Waste Incineration rule or Other Solid Waste Incineration rule. EPA typically handles CAA 129 applicability of pyrolysis units on a case by case basis through formal applicability determinations. I'd be happy to discuss further and will call you at the number listed on your email.

Regards,

Amy

From: Zach Brenton <zach.brenton@carolinaseedsystems.com>
Sent: Tuesday, January 5, 2021 8:09 PM
To: Hambrick, Amy <Hambrick.Amy@epa.gov>
Subject: Bio solids incineration questions

Hello Amy,

My name is Zach Brenton. My firm is currently exploring the installation of a pyrolysis/biochar facility to handle some agricultural waste/residues within our operations. I had a conversation with my local municipality about potentially incorporating some biosolids from their wastewater treatment facilities as a supplementary feedstock.

Would a pyrolysis facility fall under SSI EPA standards? If so, could we set up a quick call 15-20mins? It would be great to just talk with someone for a little bit more background.

Thanks. Looking forward to it.

Zach
--
Zachary Brenton
Carolina Seed Systems - Founder
zach.brenton@carolinaseedsystems.com
C: 843.702.7430

Message

From: Modak, Nabanita [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D1340065FDF645329A23F0E44DF1F39C-MODAK, NABANITA]
Sent: 11/2/2021 3:54:27 PM
To: Melvin Keener [mel@crwi.org]
Subject: RE: Re[4]: OSWI final rule

We are working on the timeline. But, nothing concrete yet.

From: Melvin Keener <mel@crwi.org>
Sent: Tuesday, November 2, 2021 10:53 AM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Subject: Re[4]: OSWI final rule

That makes sense. I saw the pyrolysis/gasification ANPRM. I wondered if the comments received on the OSWI prompted EPA to look at some additional, potentially unregulated sources. I just supposed you would finish up the current OSWI rule and potentially start a new rule making based on the information gathered from the ANPRM. Plus the Agency has to decide whether some of these sources are under 129 or 111/112. No reason why the Agency should do it in one rule making. But that will mean a re-proposal if the Agency decides to add subcategories. Do you have any estimates of timetables for making decisions other than the 2024 date?

------ Original Message ------
From: "Modak, Nabanita" <Modak.Nabanita@epa.gov>
To: "Melvin Keener" <mel@crwi.org>
Sent: 11/2/2021 10:39:14 AM
Subject: RE: Re[2]: OSWI final rule

EPA currently does not have adequate information or data to address the adverse comments. In order to address these comments, the agency needs to gain a comprehensive understanding of certain OSWI subcategories, particularly that are currently excluded from the rule. We also issued an ANPRM for pyrolysis and gasification units. The agency would like to analyze the information received through the ANPRM and evaluate how it impacts the final OSWI rule.

From: Melvin Keener <mel@crwi.org>
Sent: Tuesday, November 2, 2021 10:32 AM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Subject: Re[2]: OSWI final rule

That seems like a long extension. What's going on?

------ Original Message ------
From: "Modak, Nabanita" <Modak.Nabanita@epa.gov>
To: "Melvin Keener" <mel@crwi.org>
Sent: 11/2/2021 10:28:42 AM
Subject: RE: OSWI final rule

Hi Mel,
Thanks for your email. No, you did not miss it. The court has further extended the deadline to promulgate the final OSWI rule to March 1, 2024.

Regards
Nabanita

From: Melvin Keener <mel@crwi.org>
Sent: Tuesday, November 2, 2021 10:13 AM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Subject: OSWI final rule

Good morning. I hope you and your family are doing well.

If I remember correctly, EPA got an extension on the OSWI final rule until October 31, 2021. I don't remember seeing this in the Federal Register. Did I miss it?

Mel

Message

From: Modak, Nabanita [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D1340065FDF645329A23F0E44DF1F39C-MODAK, NABANITA]
Sent: 9/23/2020 9:45:48 PM
To: Meyers, Robert [RMeyers@crowell.com]
Subject: RE: OLEM Contacts

Hi Bob,
Tracy is the lead for NHSM rule. She will be able to help you out with the technical questions regarding legitimacy criteria, ingredients, and etc. OSWI is in my shop. I am leading the pending OSWI rule.

Thanks
Nabanita

From: Meyers, Robert <RMeyers@crowell.com>
Sent: Wednesday, September 23, 2020 3:53 PM
To: Modak, Nabanita <Modak.Nabanita@epa.gov>
Subject: RE: OLEM Contacts

Thanks Nabanita

Do you mean she is lead on the pending OSWI rule? Happy to talk to her as follow-up to our conversation.

From: Modak, Nabanita <Modak.Nabanita@epa.gov>
Sent: Wednesday, September 23, 2020 1:01 PM
To: Meyers, Robert <RMeyers@crowell.com>
Cc: Fruh, Steve <Fruh.Steve@epa.gov>; Atagi, Tracy <Atagi.Tracy@epa.gov>
Subject: OLEM Contacts

External Email

Hi Bob,
Sorry, I missed your call. You were asking for possible contacts in OLEM to reach out to regarding the Tigercat applicability determination.

Tracy Atagi is the NHSM rule lead. Please feel free to contact her for technical issues about the rule. If you are looking for someone in the management chain, it would be Peter Wright (Assistant Administrator, OLEM), or Carolyn Hoskinson, ORCR Office Director. Please let me know if you have any further questions.

Thanks
Nabanita

Message

From: Lopez, Catherine [catherine.lopez@doh.hawaii.gov]
Sent: 5/1/2018 6:54:12 PM
To: Modak, Nabanita [Modak.Nabanita@epa.gov]
Subject: OSWI applicability questions
Attachments: cbsa2013_HI.pdf

Hi Nabanita,
I'm with the Department of Health, Clean Air Branch in Hawaii. Region 9 provided your name as a contact for OSWI applicability questions.

We have a facility that is proposing to operate a Micro Auto Gasification System (MAGS).

A brief summary of my questions:
Is the MAGS unit considered an incinerator for the purposes of the OSWI?
If it is considered and incinerator for the purposes of OSWI, can the unit be considered excluded from the OSWI using the rural institutional waste incinerator exclusion?

Questions:

1. Q: Is the MAGS considered an incineration unit for the purposes of OSWI applicability?

   From the manufacturer's website:

MAGS uses the Auto Gasification Process to thermally break down hydrocarbons in waste and transform them into a residue (bio-char) and energy. The treatment reactor is about the same size as a 55 gallon drum. Within the drum, the waste is heated and breaks down to carbonaceous char (bio-char) and a gas consisting mostly of hydrogen and carbon monoxide (syngas). The synthesis gas is used as the fuel for the process.

In MAGS, the syngas becomes the main fuel, minimizing the need for external fuel sources. Combustion of the syngas is accomplished in a combustion chamber operating under controlled temperature and air flow conditions.

Manufacturer website: https://terragon.net/resource-recovery-solutions/energy-from-waste/

Please let me know if you need additional information.

2. If the MAGS is an incineration unit for the purposes of the OSWI regulation:

   Q: As part of determining whether the source can qualify for the §60.2887(h) Rural institutional waste incinerators exclusion, is the source bound to using OMB Bulletin No. 05-02…dated February 22, 2005 which is cited in the definition of MSA in the OSWI or is it correct to use the most current publication of statistical data?

The July 18, 2011 *Frequently Asked Questions Regarding NSPS, EG, and State Plan Process for HMIWI*, states that the Metropolitan Statistical Area cited in the HMIWI regulation should be used and not the most current publication. I'd like to verify whether this is also correct with regard to the OSWI, that the MSA sited in the OSWI regulation should be used, and not the most current publication.

3. Please see the attached cbsa2013_HI.pdf which shows Hawaii's Metropolitan and Micropolitan Statistical Areas. The proposed source would be located in Kalaupapa National Park which is located:

a. on the island of Molokai, a Micropolitan Statistical Area in OMB Bulletin No. 05-02 dated February 22, 2005.
b. less than 50 miles from the coastline of Honolulu, the nearest Metropolitan Statistical Area listed in OMB Bulletin No. 05-02 dated February 22, 2005. The source is located approximately 45 miles from the coastline of the island of Oahu.

Although less than 50 miles from the nearest Metropolitan Statistical Area, can the source be considered for exemption from the OSWI regulation through §60.2887(h) Rural institutional waste incinerators exclusion based on its isolation?

Kalaupapa National Park is extremely isolated and is not accessible by automobile. Additional information detailing the remoteness of the location:

https://www.nps.gov/kala/planyourvisit/directions.htm

4. Hawaii does not have delegation of the OSWI regulations.

If the facility can be considered for exemption from § 60.2887(h), for Rural institutional waste incinerators, to whom should the application for exclusion be submitted?

Please call or email if you have any questions on the information I have provided.

Thank you for your time,

Cathy Lopez
Clean Air Branch
Hawaii Department of Health
808-586-4200

Message

From: Spells, Charlene [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=4E771FEB1517492F84E1BCAAA7367961-CSPELLS]
Sent: 8/13/2018 3:15:24 PM
To: Elter, Thomas (DEC) [thomas.elter@dec.ny.gov]; Gardella, Anthony [Gardella.Anthony@epa.gov]
CC: Parker, Reginald (DEC) [reginald.parker@dec.ny.gov]; Gilbert, Meghan M (DEC) [meghan.gilbert@dec.ny.gov]
Subject: RE: Lockheed Martin demonstration project

Hi Tom,

From the very limited information you provided, I believe there is a potential for the engine and/or the flare to be covered under section 129 as a municipal waste combustor. See the definition of MWC unit at 40 CFR 60.51b or 60.1465:

Municipal waste combustor, MWC, or *municipal waste combustor unit:* (1) Means any setting or equipment that combusts solid, liquid, or **gasified** municipal solid waste including, but not limited to, field-erected incinerators (with or without heat recovery), modular incinerators (starved-air or excess-air), boilers (i.e., steam generating units), furnaces (whether suspension-fired, grate-fired, mass-fired, air curtain incinerators, or fluidized bed-fired), and pyrolysis/combustion units. Municipal waste combustors do not include pyrolysis/combustion units located at a plastics/rubber recycling unit (as specified in §60.50b(m)). Municipal waste combustors do not include cement kilns firing municipal solid waste (as specified in §60.50b(p)). Municipal waste combustors do not include internal combustion engines, gas turbines, or other combustion devices that combust landfill gases collected by landfill gas collection systems.

This e-mail does not constitute an applicability determination. Please coordinate with Ted, the Regional Office contact, to submit a formal applicability request if that is something you are interested in pursuing.

Regards,
Charlene E. Spells
U.S. EPA
OAQPS/SPPD
RTP, NC 27711
Phone: (919) 541-5255 Fax: (919) 541-3470
spells.charlene@epa.gov

From: Elter, Thomas (DEC) [mailto:thomas.elter@dec.ny.gov]
Sent: Thursday, August 09, 2018 11:21 AM
To: Spells, Charlene <Spells.Charlene@epa.gov>
Cc: Parker, Reginald (DEC) <reginald.parker@dec.ny.gov>; Gilbert, Meghan M (DEC) <meghan.gilbert@dec.ny.gov>
Subject: Lockheed Martin demonstration project

Hi Charlene

Hope all is well.

I thought I would follow up on information that was provided to you by Nabanita, which she received from Lockheed Martin by way of me.

As a summary, Lockheed will take plastic derived from MSW (processed off-site by a different company) and feed it to a system that will subject it to high temperatures in the absence of air to produce a syngas. A by-product is solid char. The syngas will be treated to remove contaminants and unwanted gases (like HCl) before being sent to an engine that will be used to generate electricity. Attached is a spec sheet showing the components of the syn gas.

For what it's worth, I've looked at all of the incinerator rules, and I can't find anywhere where gasification of MSW had been looked at in terms of developing a standard. Generally, EPA will look at categories (subcategories, even) and define Section 129 MACT for each subcategory. (EPA listed 15 categories in its OSWI preamble, none of which was gasification.) There is a reference to "pyrolysis/combustion," which is included in the regulation's definition of municipal waste combustion unit, but the EPA, in its preamble, described this device as having two chambers, with a starved air

primary chamber followed by an afterburner. The device EPA described is different, vastly, than what is being proposed at Lockheed, which is a gasification demonstration project to produce a fuel that can be used in an engine.

I did find, in a preamble to the OSWI proposal, a statement that EPA has interpreted the CAA to allow EPA to consider the primary function of the combustion unit in making a determination of whether a particular unit should be subject to CAA Section 129. In this case, to me it is clear that the primary function is to generate electricity; there are much easier ways to incinerate MSW than to gasify.

Finally, I want to note that in 2014, I discussed this project with EPA as it applied to the NSPS engine rules (IIII), and they concluded that they would await test results in order to determine what limits to apply. Perhaps we should consider a similar track, as DEC will require extensive testing on this demonstration. That data may be helpful in arriving at a conclusion.

Please let me know if you have any questions. Also, Lockheed is available to talk to you, and a tour of the facility may be helpful.

Thanks,

Tom E

Tom Elter
Professional Engineer 1, Division of Air Resources

New York State Department of Environmental Conservation
615 Erie Boulevard West, Syracuse, NY 13204
P: (315) 426-7470 | F: (315) 426-7487 | thomas.elter@dec.ny.gov
www.dec.ny.gov |

Message

From: Regina TAN (NEA) [Regina_TAN@nea.gov.sg]
Sent: 4/5/2021 3:33:25 AM
To: Chen, Team [chen.team@epa.gov]
CC: Zhong HENG (NEA) [HENG_Zhong@nea.gov.sg]; Alexander LIM (NEA) [Alexander_LIM@nea.gov.sg]; Jacin CHAN (NEA) [Jacin_CHAN@nea.gov.sg]; Chika CHOW (NEA) [CHOW_Chika@nea.gov.sg]; Joanna Hy LIM (NEA) [Joanna_Hy_LIM@nea.gov.sg]; Stefanie KOH (NEA) [Stefanie_KOH@nea.gov.sg]; Spells, Charlene [Spells.Charlene@epa.gov]; Voorhees, Scott [Voorhees.Scott@epa.gov]; Shiffman, Cari [Shiffman.Cari@epa.gov]
Subject: RE: EPA Information & POCs on industrial emissions from WTE incinerators
Attachments: ATT00001.txt

Message Classification: Restricted

Hi Team,

Thank you for the information shared, they are most helpful.

Do allow me and my colleagues from the Pollution Control 2 Division of NEA to come in at this point to follow-up on this topic. We will be grateful if you/Ms Spells could further address some queries below, and assist to direct questions on enforcement and penalties to the relevant colleagues if applicable:

Regulation of WTE Incineration Plants

- May we verify that all Solid Waste Incineration Units (SWIU), regardless of size and capacities, are to apply for an Operating Permit under Title V of the Clean Air Act?

- Besides the Operating Permit, New Source Review Permitting and Site Implementation Plan/permits, are there other permits that SWIU will need to acquire at the Federal Level?

- Prior to the establishment of any types of SWIU, are environmental impact assessments involving air dispersion modelling mandated at the federal level? If so, what would be the passing criteria such that the SWIU will not deteriorate ambient air quality?

- We are interested to find out about the USA's regulation of a subset of WTE Incineration Plants; that is smaller-scale plants (capacity of ~ ≤ 15 tonnes per day (TPD)) located near sensitive receptors and/or located on premises handling their own municipal solid waste (MSW). For these plants, would the Regulations for "Other Solid Waste Incineration (OSWI) units" (https://www.epa.gov/stationary-sources-air-pollution/other-solid-waste-incinerators-oswi-new-source-performance) be more applicable? If so, we have the following questions:
  - We note OSWI units are further split into two types of WTE incinerators; 1) Very small municipal waste combustion (VSMWC) units that burn < 35 TPD MSW, and 2) Institutional waste incineration (IWI) units located at institutions (e.g. public or private school; college or university; church or civic organization; State or Federal government agency; etc.) that burn MSW generated on site. For IWI units, does it include other private premises such as shopping malls, entertainment areas, tourist attractions etc.? Currently, is there a cap on the capacity of IWI units? Are IWI units allowed to treat waste beyond MSW?
  - We understand there was a recent review in 2019 proposing the subcategorising of IWI and VSMWC units based on size i.e. large units that have capacities > 10 TPD and small units that have capacities ≤ 10 TPD. Has the review concluded, and are the new emission standards for the subcategories in force? Similarly, is there a cap for the capacity of "large IWI units" following this review?

o Besides air emission limits, are there noise and odour limits set for these plants?

- There is an array of technologies available besides incineration that could be adopted by "on-site" WTE plants e.g. gasification, pyrolysis, magnetic plasma etc. Are they separately regulated (e.g. permits required, air emission limits etc.) from that of conventional WTE incinerators?

Enforcement and Penalties

- Are non-compliance penalties to be determined on a case-by-case under the EPA CAA Regulations (e.g. if a SWIU, regardless of size, is found to emit pollutants exceeding the applicable limits)?

Many thanks!

Regards,

Regina Tan • Executive Scientific Officer • Pollution Control 2 Division, Operations Planning Branch
40 Scotts Road, #12-00 Environment Building, Singapore 228231 • O: +65 6708 6144 • regina_tan@nea.gov.sg

nea.gov.sg @NEASingapore @nea_sg NEA Singapore youtube.com/NEAsg

From: Zhong HENG (NEA) <HENG_Zhong@nea.gov.sg>
Sent: Monday, 5 April 2021 10:08 AM
To: Chen, Team <chen.team@epa.gov>
Cc: Alexander LIM (NEA) <Alexander_LIM@nea.gov.sg>; Jacin CHAN (NEA) <Jacin_CHAN@nea.gov.sg>; Chika CHOW (NEA) <CHOW_Chika@nea.gov.sg>; Regina TAN (NEA) <Regina_TAN@nea.gov.sg>; Joanna Hy LIM (NEA) <Joanna_Hy_LIM@nea.gov.sg>; Stefanie KOH (NEA) <Stefanie_KOH@nea.gov.sg>; Spells, Charlene <Spells.Charlene@epa.gov>; Voorhees, Scott <Voorhees.Scott@epa.gov>; Shiffman, Cari <Shiffman.Cari@epa.gov>
Subject: RE: EPA Information & POCs on industrial emissions from WTE incinerators

Message Classification: Restricted

Hi Team,

Thank you very much for your assistance! We will look through the information you and your colleagues have kindly provided and come back to you on any subsequent follow-ups we would like to make.

Best regards,

Heng Zhong • Assistant Manager (International Relations) • Policy Division, Strategic Planning and Policy Group
40 Scotts Road, #19-00 Environment Building, Singapore 228231 • O: +65 6731 9710 • heng_zhong@nea.gov.sg

nea.gov.sg @NEASingapore @nea_sg NEA Singapore youtube.com/NEAsg

From: Chen, Team <chen.team@epa.gov>
Sent: Thursday, 1 April 2021 3:20 AM
To: Zhong HENG (NEA) <HENG_Zhong@nea.gov.sg>
Cc: Alexander LIM (NEA) <Alexander_LIM@nea.gov.sg>; Jacin CHAN (NEA) <Jacin_CHAN@nea.gov.sg>; Chika CHOW (NEA) <CHOW_Chika@nea.gov.sg>; Regina TAN (NEA) <Regina_TAN@nea.gov.sg>; Joanna Hy LIM (NEA) <Joanna_Hy_LIM@nea.gov.sg>; Stefanie KOH (NEA) <Stefanie_KOH@nea.gov.sg>; Spells, Charlene <Spells.Charlene@epa.gov>; Voorhees, Scott <Voorhees.Scott@epa.gov>; Shiffman, Cari <Shiffman.Cari@epa.gov>
Subject: EPA Information & POCs on industrial emissions from WTE incinerators

Hi Zhong,

Below are some resources on industrial emissions from WTE incineration that may provide insight on how EPA regulates this sector. My colleague, Charlene Spells, covers waste-to-energy incineration and could help with follow-up questions related to the regulations. If the interest is more towards the enforcement and penalty side, I'd have to circle back with colleagues in another office. We could also arrange a video-conference if you'd like to discuss specific follow-up questions or topics.

- Solid waste combustion is regulated under Section 129 of the Clean Air Act (https://www.govinfo.gov/content/pkg/USCODE-2013-title42/html/USCODE-2013-title42-chap85-subchapI-partA-sec7429.htm) which directs EPA to develop regulations limiting emissions of nine specific air pollutants (particulate matter, carbon monoxide, dioxins/furans, sulfur dioxide, nitrogen oxides, hydrogen chloride, lead, mercury, and cadmium). General information on the types of regulations covering waste management can be found here: https://www.epa.gov/stationary-sources-air-pollution/clean-air-act-guidelines-and-standards-waste-management.

- For information concerning "on-site waste-to-energy incinerators, the following are links to specific incinerator types may be most applicable:
  - Regulations for Large Municipal Waste Combustion Units (WTE): https://www.epa.gov/stationary-sources-air-pollution/large-municipal-waste-combustors-lmwc-new-source-performance.
  - Regulations from Small Municipal Waste Combustion Units: https://www.epa.gov/stationary-sources-air-pollution/small-municipal-waste-combustors-smwc-new-source-performance.
  - Regulations for Commercial and Industrial Solid Waste Incineration Units (with and without energy recovery): https://www.epa.gov/stationary-sources-air-pollution/commercial-and-industrial-solid-waste-incineration-units-ciswi-new.

NOTE: From the above links, the actual regulations can be accessed which will provide emission limits, siting requirement, operating conditions etc.

- EPA establishes regulations at the national level, but States have the option to accept full or partial responsibility for implementing and enforcing these regulations. General information can be found here: https://www.epa.gov/caa-permitting/delegation-clean-air-act-authority.

Best regards,
Team

Team Chen
Office of International and Tribal Affairs
U.S. Environmental Protection Agency
(202) 564-8352
chen.team@epa.gov

From: Zhong HENG (NEA) <HENG_Zhong@nea.gov.sg>
Sent: Tuesday, March 09, 2021 3:53 AM
To: Kasat, Rakhi <Kasat.Rakhi@epa.gov>; Chen, Team <chen.team@epa.gov>
Cc: Alexander LIM (NEA) <Alexander_LIM@nea.gov.sg>; Jacin CHAN (NEA) <Jacin_CHAN@nea.gov.sg>; Chika CHOW (NEA) <CHOW_Chika@nea.gov.sg>; Guo Wei GOH (NEA) <GOH_Guo_Wei@nea.gov.sg>; Regina TAN (NEA) <Regina_TAN@nea.gov.sg>; Joanna Hy LIM (NEA) <Joanna_Hy_LIM@nea.gov.sg>; Stefanie KOH (NEA) <Stefanie_KOH@nea.gov.sg>
Subject: Request for US EPA contacts

Message Classification: Restricted

Dear Rakhi and Team,

I hope this email finds you in good health and spirits. I'm Heng Zhong, Jacin's colleague at NEA. I'm writing to you today to seek your assistance to make contact with the relevant subject matter experts at the US EPA. My colleagues from the Pollution Control Divisions are embarking on some internal benchmarking exercises, and are keen to take reference from the US EPA's standards and practices.

2 To give you a clearer picture, the details of our request are as follows:

(i) **Inspection and enforcement regimes for pollution control, hazardous substances and toxic waste management.** My colleague Guo Wei is interested to understand the EPA's inspection and enforcement regimes for pollution control (e.g. industrial emissions / trade effluent discharges), hazardous substances, and toxic waste management, the frequency of inspections, and the setup of the inspection teams (number of inspectors, educational/technical qualification, number of premises allocated per inspector), the additional work scopes that the inspectors are required to do besides inspecting the industries (e.g. licensing approvals) etc.

(ii) **Industrial emissions from on-site waste-to-energy incinerators.** My colleagues Regina, Joanna, and Stefanie are interested to understand the EPA's framework for regulating on-site waste-to-energy incinerators. This would include emission limits, approval processes, siting and operating conditions, accompanying penalties for breaching such conditions, etc.

3 I would be grateful for your kind assistance to link us up with the relevant subject matter experts in the EPA, with whom we can exchange views over email or through video conference on these topics.

4 I look forward to hearing from you. Thank you.

Best regards,
Heng Zhong • Assistant Manager (International Relations) • Policy Division, Strategic Planning and Policy Group
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Message

From: Gardella, Anthony [Gardella.Anthony@epa.gov]
Sent: 12/12/2018 9:07:13 PM
To: Elter, Thomas (DEC) [thomas.elter@dec.ny.gov]
CC: Ritz, Phillip [Ritz.Phillip@epa.gov]; Spells, Charlene [Spells.Charlene@epa.gov]
Subject: RE: lockheed

Hi Tom,

No further progress here and **Ex. 6 Personal Privacy (PP)**.

Do you know if Lockheed plans to discuss with EPA R2 the potential for coverage under the NSPS for either OSWI or CISWI as you mention in NYSDEC letter to Lockheed dated 11/19/18; or do you know if Lockheed intends to submit an applicability determination request to EPA?

Also, in your 11/19/18 letter to Lockheed which you sent to me in your 11/30/18 email, are the three scenarios concerning the three separate feedstock scenarios the same scenarios that you sent to me and Nabanita in past emails? It's not clear to us. Can you send us the flow diagrams for these three scenarios (pyrolysis section as well as syngas combustion) described in NY's 11/19/18 letter to Lockheed along with mass flow rates? Why does NY say that these three scenarios are subject to Part 212 and not 219 (NY incinerator rule). Why aren't they subject to OSWI or CISWI?

Ted

From: Elter, Thomas (DEC) <thomas.elter@dec.ny.gov>
Sent: Wednesday, December 12, 2018 3:40 PM
To: Gardella, Anthony <Gardella.Anthony@epa.gov>
Subject: lockheed

Hi Ted

Has EPA decided anything about Lockheed Martin?

Tom

Tom Elter
Regional Air Pollution Engineer
Professional Engineer 2, Division of Air Resources

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Message

From: Elter, Thomas (DEC) [thomas.elter@dec.ny.gov]
Sent: 12/12/2018 9:44:26 PM
To: Gardella, Anthony [Gardella.Anthony@epa.gov]
CC: Ritz, Phillip [Ritz.Phillip@epa.gov]; Spells, Charlene [Spells.Charlene@epa.gov]
Subject: RE: lockheed

Hi Ted

I do not know Lockheed's plans regarding contacting EPA Region 2, but they did ask me whether they had to go higher up in EPA. I don't think they are going to ask for a determination.

The flow chart for the three scenarios is exactly the same, just the feedstock has changed. And Ted, this is R&D; they make process changes as needed, and will be testing the engineering and emissions. This is not some off-the-shelf design – it has kinks. I've already mentioned that it has taken them 4 years to get to process wood chips into syngas. The salient point is they produce syngas, it is scrubbed, and then used in an engine. Or a backup flare.

We have concluded that they are not subject to the NY incinerator rule provided the syngas is beneficially used. Which is their goal. Ted, this is not incineration – the plastics are gasified in an oxygen-free environment. The syngas is scrubbed and combusted. This was not studied, as far as I know, in the development of the rule.

As for applicability to CISWI/OSWI, that is your determination to make. But, you already made the determination for a similar process, maybe more than one.

Maybe EPA should allow this process as R&D, gather data and then make an assessment.

OK,

Thanks

Tom

From: Gardella, Anthony [mailto:Gardella.Anthony@epa.gov]
Sent: Wednesday, December 12, 2018 4:07 PM
To: Elter, Thomas (DEC) <thomas.elter@dec.ny.gov>
Cc: Ritz, Phillip <Ritz.Phillip@epa.gov>; Spells, Charlene <Spells.Charlene@epa.gov>
Subject: RE: lockheed

Hi Tom,

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To: Gardella, Anthony <Gardella.Anthony@epa.gov>
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Message

From: Elter, Thomas (DEC) [thomas.elter@dec.ny.gov]
Sent: 8/9/2018 3:20:52 PM
To: Spells, Charlene [Spells.Charlene@epa.gov]
CC: Parker, Reginald (DEC) [reginald.parker@dec.ny.gov]; Gilbert, Meghan M (DEC) [meghan.gilbert@dec.ny.gov]
Subject: Lockheed Martin demonstration project
Attachments: RDF Syngas and Emissions Data for NYSDEC_LM Adv Gasification_08 Aug 2018.pdf

Hi Charlene

Hope all is well.

I thought I would follow up on information that was provided to you by Nabanita, which she received from Lockheed Martin by way of me.

As a summary, Lockheed will take plastic derived from MSW (processed off-site by a different company) and feed it to a system that will subject it to high temperatures in the absence of air to produce a syngas. A by-product is solid char. The syngas will be treated to remove contaminants and unwanted gases (like HCl) before being sent to an engine that will be used to generate electricity. Attached is a spec sheet showing the components of the syn gas.

For what it's worth, I've looked at all of the incinerator rules, and I can't find anywhere where gasification of MSW had been looked at in terms of developing a standard. Generally, EPA will look at categories (subcategories, even) and define Section 129 MACT for each subcategory. (EPA listed 15 categories in its OSWI preamble, none of which was gasification.) There is a reference to "pyrolysis/combustion," which is included in the regulation's definition of municipal waste combustion unit, but the EPA, in its preamble, described this device as having two chambers, with a starved air primary chamber followed by an afterburner. The device EPA described is different, vastly, than what is being proposed at Lockheed, which is a gasification demonstration project to produce a fuel that can be used in an engine.

I did find, in a preamble to the OSWI proposal, a statement that EPA has interpreted the CAA to allow EPA to consider the primary function of the combustion unit in making a determination of whether a particular unit should be subject to CAA Section 129. In this case, to me it is clear that the primary function is to generate electricity; there are much easier ways to incinerate MSW than to gasify.

Finally, I want to note that in 2014, I discussed this project with EPA as it applied to the NSPS engine rules (IIII), and they concluded that they would await test results in order to determine what limits to apply. Perhaps we should consider a similar track, as DEC will require extensive testing on this demonstration. That data may be helpful in arriving at a conclusion.

Please let me know if you have any questions. Also, Lockheed is available to talk to you, and a tour of the facility may be helpful.

Thanks,

Tom E

Tom Elter
Professional Engineer 1, Division of Air Resources

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Lockheed Martin Advanced Gasification Project
Syngas and Emissions Predictions for RDF
08 Aug 2018

Syngas Composition

Clean Syngas to Engine	
Composition	vol.%
H_2	59.65
CH_4	5.64
C_2H_4	0.27
C_6H_6	0.15
CO	20.92
CO_2	9.74
H_2O	3.54
H_2S	0.01
HCl	0.01
Tars	<50 mg/Nm3
Particulates	<3.50 mg/Nm3

Syngas Heating Value

Heating Value, Clean Syngas to Engine		
Units	Low	High
MJ/kg	19.6	22.4
MJ/Nm3	11.0	12.7
BTU/lb	8,427	9,630
BTU/scf	280	320

Emissions

Burner Flue Gas	
Composition	vol.%
CO_2	5
O_2	10
H_2O	11
N_2	73
Ar	1
VOC	TBD
NOx	TBD
CO	TBD
Particulates	<20 mg/Nm3*

Engine Exhaust	
Composition	vol.%
CO_2	3.24
O_2	14.95
H_2O	7.26
N_2	73.66
HCl	TBD
Ar	0.85
SOx	TBD
VOC	TBD
Nox	TBD
CO	TBD

* Based on exhaust gas at normal conditions (68°F and 14.692 psig), less water vapor content